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THE

BOTANICAL CLASS-BOOK

AND

FLORA OF PENNSYLVANIA,

DESIGNED FOR

Seminaries of Learning and Private Classes.

IN TWO PARTS.

PART I.—STRUCTURAL AND PHYSIOLOGICAL BOTANY.

PART II.—SYSTEMATIC BOTANY.

COMPRISING A BRIEF SKETCH OF THE LINNÆAN AND NATURAL
SYSTEMS OF BOTANY; A GLOSSARY OF TECHNICAL
TERMS; ANALYTICAL TABLES, AND THE

NATURAL ORDERS,

ILLUSTRATED BY A FLORA OF PENNSYLVANIA, WHICH EMBRACES DESCRIPTIONS
OF NEARLY NINE-TENTHS OF THE INDIGENOUS FLOWERING
PLANTS OF THE NORTHERN UNITED STATES.

BY HENRY R. NOLL.

Lewisburg, Pa.:
O. N. WORDEN, PRINTER.
1852.

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PREFACE.

This volume has been prepared expressly as a Class Book of Botany for beginners, designed chiefly for students in our seminaries of learning and private classes, as well as a convenient manual for those more advanced in the science. The first part of the work contains an introduction to Structural and Physiological Botany, in which I have briefly described the organic elements or tissues of plants, and their compound organs—such as the structure, growth, theoretical nature and office of the roots, stems, buds, leaves, flowers, fruit and seeds; together with the nature and results of germination, and a short treatise on the food and nutrition of plants. The second part of the volume is devoted to Systematic Botany, and comprises a brief sketch of the Artificial System of Linnæus, together with its classes, orders, &c.; and of the Natural System of Jussieu as modified by De Candolle and others, together with its divisions, classes, orders, &c.; and a Glossary of Botanic Terms. The whole is accompanied with a Flora of Pennsylvania, in which are described all, or nearly all, the indigenous and naturalized flowering and filicoid plants of our State, together with some of the more commonly cultivated exotics of our gardens; arranged according to the Natural System now so generally adopted in works of this kind. But, in order to secure all the advantages of the Linnæan System, and to render analysis as simple as possible to the beginner, I have given a synopsis of the genera, arranged under their respective classes and orders, describing the more prominent characteristics of each, with a reference to the page where the genus and species are fully described in their respective orders.

146

In compiling and preparing that part of the work which relates to Physiological and Structural Botany, I have chiefly relied on the *"Botanical Text Book"* of Doctor Asa Gray, Fisher Professor of Natural History in Harvard University—an American work of the highest merit. In regard to the names, characteristics and arrangement of the Natural Orders, my principal authorities have been the work above mentioned, and a work by the same author entitled *"Botany of the Northern United States."*

With few exceptions, I have adopted the nomenclature of the North American Flora of Torrey and Gray, for our native and naturalized plants, (so far as that flora at present extends,) and for our cultivated exotics, the nomenclature of the "Prodromus" of De Candolle, regarding these, as they truly are, standard works.

In describing the genera and species together with their locality, I have consulted Beck's *"Botany of the United States north of Virginia,"* Doctor Darlington's *"Flora Cestrica,"* Wood's *"Class Book of Botany,"* Gray's *"Botany of the Northern United States,"* and *"Barton's Botany and Flora."*

Such as my work is, I now submit it to the public. That it will be found free from errors, I hardly expect. I have, however, prepared it with much care and study, having devoted untiringly to the study of botany, for several years, and to the preparation of this work, all the hours of leisure which my occupation as a mechanic permitted me to enjoy. In conclusion, I have only to ask of those who may discover special imperfections in the work, or who may be able to suggest additions important to be made, with descriptions of genera and species indigenous to our State not described in the present work, to communicate their suggestions to me, and should another edition be called for, I shall endeavor to rectify its imperfections to the best of my ability.

H. R. NOLL.

LEWISBURG, JANUARY, 1851.

INTRODUCTION.

BRIEF SURVEY OF THE SCIENCE.

The science of Botany has recently attracted considerable attention in our country, so much so, that it is becoming a popular study in our seminaries of learning. By the labors of De Candolle and Lindley, in Europe, and of Drs. Torrey and Gray, of our own country, it has been established on the basis of inductive philosophy, and elevated nearly to the rank of an exact science.

It is a science which, though it can not be considered as greatly advancing our pecuniary interests, affords more enjoyment than wealth or honor can bestow. It effectually combines pleasure with improvement, and is calculated to lead the pious mind to greater reverence for the Deity.

The objects of its investigation are beautiful beyond description; adapted to please the eye, refine the taste and improve the heart; leading to vigorous exercise in the open air, which is conducive to health and cheerfulness. It conducts the student into the fields and forests, amid the verdure of spring and the bloom of summer. It leads him to the charming retreats of Nature in her wild luxuriance, along winding streams; to the borders of craggy rocks; and where she patiently smiles under the improving hand of cultivation. This study imparts a taste for the beautiful in nature, fills the soul with ravishing emotions, and opens before us the enchanted avenues of a world full of wonders.

The study of Botany affords a pleasure which can be equally enjoyed in youth, when the affections are warm and the imagination is vivid; in more advanced life, when sober judgment assumes the reins; in the sunshine of fortune, and in the obscurity of poverty. The opening buds of spring, the warm, luxuriant blossoms of full blown summer, the yellow bowers of autumn, and the leafless, desolate groves of winter, alike afford amusement and gratification to the botanist.

DEFINITION OF A PLANT.

Philosophers and Naturalists have distinguished the natural world into three great departments, commonly called the MINERAL, VEGETABLE, and ANIMAL KINGDOMS.

Plants are intermediate between minerals and animals. They are distinct from the former by their organization and living principle; and differ from the latter by the absence of instinct and intelligence.

A mineral is an inorganic mass of matter, the result of mere aggregation, and due to external common forces. The separation of the organs of a plant destroys its identity as a species; but a stone may be broken into any number of fragments, each of which will retain the characteristics of the original body.

Plants are organized living bodies, deriving their nourishment from the earth and air, endowed with vitality, (though not with sensation,) and composed of distinct parts, each of which is essential to the completeness of their being.

Animals, like plants, are organized, living bodies, endowed with vitality, and composed of distinct parts, but they are superior to plants by possessing the faculty of perception.

Plants being closely connected to the mineral kingdom are fixed to the earth or other substance on which they grow, and derive their nourishment from it by absorbing into their systems mineral food, which is assimilated to their own substance under the influence of light in organs exposed to the atmosphere. Animals on the contrary possess the faculty of locomotion and the endowment of sensation; subsist on organized matter and have the power of selecting the food ready prepared for their nourishment which is received into and assimilated by an internal reservoir or stomach. Thus minerals, by the beautiful economy of nature, contribute towards the support of animals through the medium of plants.

Plants, like animals, are destined to perform their functions for a limited period only; some live for one season, others twice that period; the apple-tree flourishes through a century, and the cedar is supposed to brave the tempests of a thousand years; but the hand of time sooner or later presses upon them all, and without the aid of external injury, their vegetating powers cease; and sharing the fate of all organized beings, they submit to decomposition, and crumble into their primeval elements.

BOTANY.

PART I.

GENERAL DIVISIONS OF THE SCIENCE.

1. The English word Botany is derived from the Greek *batane*, a plant.

2. Botany is that branch of natural history which teaches the knowledge of the vegetable kingdom. It comprehends every scientific inquiry that can be made respecting plants, their structure, habits, properties, the laws which govern them, and their office in the general economy of the world; together with their nomenclature and classification.

3. Botany, like its kindred sciences, is resolved into distinct departments, according to the nature of the subject they treat. That department which investigates the organic structure of plants, the kind of life which they possess, the organization through which this life is manifested, in other words, that part which informs us how plants live and grow, and fulfil the conditions of their existence, is called PHYSIOLOGICAL BOTANY. It comprises a knowledge, 1st, of the structure of plants, and of the minute and admirable machinery through which their forces operate; this is the special field of VEGETABLE ANATOMY; 2d, of the external conformations, the forms and arrangement of the several organs of which they are composed, the laws of symmetry which regulate them, and the various modifications they undergo in the successive stages of their development; this branch is called ORGANOGRAPHY, (i. e. the science of the organs of plants,) and nearly corresponds with *Comparative Anatomy* in the animal kingdom. It remains only to contemplate this operation in action; endowed with life, and fulfilling the purposes for which it was constructed; this is the province of VEGETABLE PHYSIOLOGY.

4. A second department of Botany is founded upon the relation which plants sustain to each other; upon their affinities and endless diversities. The vegetable creation is composed of many thousand species, all of which are constructed upon the same general plan, but variously modified according to their relative rank and the circumstances of their position. To describe these belongs to the province of Systematic Botany, or the study of plants, as composing the Vegetable Kingdom; as embracing an immense number of species, differing in some respects, but agreeing in others, and therefore capable of being grouped into kinds or genera, into orders, classes, &c. This department comprises, 1st, Classification, or the arrangement of plants in a systematic order, according to their relationship; 2d, special Descriptive Botany; or, an orderly account of all known plants, designated by names, and distinguished by clear and exact description.

[Necessarily connected with these departments is TERMINOLOGY or GLOSSOLOGY, which relates to the application of distinctive names or terms to the several organs of plants, and to their various modifications. The current words of our language being insufficient for the purposes of the botanist, many new terms have been introduced in order to express accurately the great variety of facts which a close examination of the plants acquaints us. Thus Botany possesses a technical language which enables us to describe the subjects of this study with a precision and brevity not otherwise attainable.]

5. Under a third department, plants may be contemplated with regard to their relations to other parts of the creation. This forms a series of interesting inquiries, which variously connect the science of Botany with Chemistry, Geology, Physical Geography, &c. Among these are inquiries as to what influence vegetation exerts upon the air; what it receives from the soil, and what it imparts to it; what it derives from the atmosphere and what it returns to it; also, what are the relations of the vegetable to the animal kingdom, considered with reference to the sustenance it furnishes the latter; and how plants and animals are mutually subservient in the general economy of the world; these inquiries belong partly to chemistry, and partly to vegetable physiology, and the practical deductions which they afford lay the foundations of scientific Agriculture, &c.

PHYSIOLOGICAL BOTANY.

VEGETABLE ANATOMY.

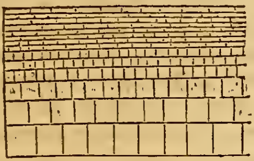
SIMPLE OR ELEMENTARY ORGANS.

6. The principal substance of which plants are composed, is known by the general name of tissue, of which there are three distinct kinds, distinguished as *cellular*, *woody* and *vascular*, which are analagous to the flesh, bones and blood vessels of animals.

CELLULAR TISSUE.

7. **Cellular Tissue** is the fleshy or succulent part of plants, of which the pulp of leaves and fruits afford familiar examples. It consists of a great number of cells, or little bladders, of organic membrane, aggregated together and cohering more or less intimately by their contiguous surfaces, constituting the honey-comb-like texture that vegetable matter displays under the microscope.

1.



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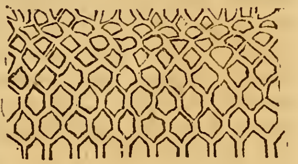


8. Their form is at first globular and egg-shaped, but afterward, being flattened by their mutual pressure, they become cubical, (Fig. 1) or twelve-sided, (Fig. 2) the cross section being six-sided, each cell assuming a form more or less regular, according to the degree of pressure exerted upon it by those adjacent.

9. Of this all plants, at their earliest (embryo) state, are entirely composed. Indeed, the plant may be traced back by observation, nearly or quite to a single cell; which cell, endowed with the power of propagation equally with the full developed plant, gives rise to other cells possessed of the same powers, and so forms the whole mass of the vegetable. The delicate walls of the cells, although not visibly perforated, (except sometimes as a secondary result,) are like all organic membrane, permeable to fluids. Through

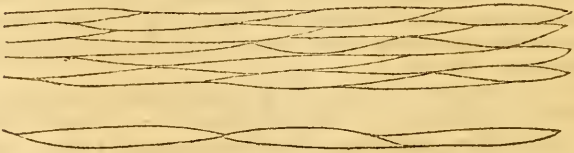
them the food of the plant is imbibed, whether directly from the atmosphere in the form of air or vapor, or in a liquid form by the roots, and transmitted throughout the vegetable; hence, plants receive their food in a fluid state only. The cells contain the juices and the products of the plant, whether liquid or solid.

10. The cells vary greatly in size, not only in different plants, but in different parts of the same plant. The largest are found in aquatics, and such plants as the gourd, where some of them are as much as 1–30th of an inch in diameter. Their ordinary diameter is about the 1–400th of an inch. In the common pink, it has been computed that more than 5000 cells are contained in the space of half a cubic line, which is equivalent to almost 3,000,000 in a cubic inch. Although this tissue is usually soft and spongy, it sometimes acquires considerable hardness by the deposition of solid instead of fluid matter. They are also sometimes drawn out to a considerable length, as in hairs and fibres of cotton, which are long and attenuated cells.

11. Besides the cellular tissue, all Flowering Plants contain more or less of two other kinds of tissue, viz: the *woody* and the *vascular*. These begin to be introduced when the plant developes from the seed, and serve to give greater strength and toughness, and to facilitate the transmission of fluids. Both of them arise, however, in all their forms from the transformation of cells, of which they are only modifications.

WOODY TISSUE.

3.



12. WOODY TISSUE, (Fig. 3) called also *fibre*, consists of slender, transparent, membranous tubes, tapering to a point each way, and adhering by their sides, the end of one tube extending beyond that of another, so as to form continuous threads. It differs from cellular tissue, in the greater tenuity

of its membrane. This tissue is not confined to the wood alone, but abounds in the inner bark, where it is usually more tough and flexible, and therefore well adapted for cloths, cordage, &c. Thus linen is made of the woody fibres of the bark of flax. It also abounds in leaves, forming the frame-work or fibrous skeleton, which gives the leaf the requisite firmness.

VASCULAR TISSUE.

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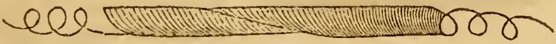

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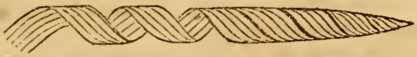

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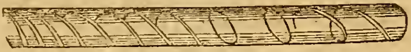


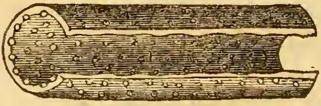
13. Vascular Tissue consists essentially of spiral vessels with their modifications. The true *spiral vessel* much resembles the woody fibre, consisting of slender tubes, of various lengths, tapering each way, but are thinner and weaker, to the inside of which a spirally-coiled fibre is adherent. The fibre uncoils elastically when the vessel is pulled asunder. In their unrolled state they are readily examined by breaking almost any young shoot or leaf-stalk, and gently separating, when the uncoiled fibres appear to the naked eye like a fine cobweb. In their perfect state they contain air, which they transmit from one to another. The spire is commonly formed of a single fibre, as in Fig. 4; it rarely consists of two fibres; but not uncommonly a considerable number, forming a band, as in Fig. 5. The turns of the coil, although generally in contact, are, sometimes, widely separated. In size spiral vessels are variable, generally their diameter is about 1–1000th of an inch; often not more than 1–3000th.

14. Ducts differ from spiral vessels in the thread being incapable of uncoiling without breaking, consisting of membranous tubes, with conical or rounded extremities, their sides being marked with transverse bars, rings or coils. In this modification of spiral vessels the tube is much lengthened, and the coil within is either *closed*, that is, will not unroll, as in the ferns, or it is *annular*, that is broken into distinct

rings, as in the garden balsam, Impatiens, (Fig. 6) or it is reticulated, that is, branching, the branches crossing so as to form a net-work. The office of all these ducts is the same, that of conveying fluid.

15. Dotted Ducts, called also Pitted, or Vasiform Tissue, consists of large tubes which are formed of cylindrical cells being marked with dots or pits (Fig. 7). They are the largest tubes in plants, and their orifices are conspicuous in the cross sections of most kinds of wood, such as the oak, chestnut, reed, &c.

7.



16. Lactiferous Tissue consists of a series of branching vessels which freely anastomose (pass to and fro), or unite, so as to form a kind of net-work with each other, crossing and re-crossing the other tissues, and spreading from the inner parts, ramify upon the outer surface, and upon the hairs, forming meshes of inconceivable fineness. These vessels serve for the passage of the nutritious sap or proper juice of the plant. Their sides are very delicate, and their average diameter is about 1–1400th of an inch. They are remarkable for their irregular contractions and expansions.

THE EPIDERMIS AND ITS APPENDAGES.

17. Epidermis. The whole surface of the plant exposed to the air (except the stigma of the flower and some parts of the root) is covered with a *cuticle* or skin, called *epidermis*, which consists of layers of cellular tissue in which the cells are much flattened and in close contact with each other. Their form is various, sometimes they are oblong and regular, whilst at others they are very dissimilar, and appear to interlock with each other.

18. Usually there is but one layer of cells, but sometimes there are two or three, especially in tropical plants. Its office in the economy of the plant is to check the evaporation of moisture.

19. Stomato. The epidermis is provided with small apertures usually of an oval form, and bounded by two or more reniform (kidney-shaped) cells placed side by side, by the contraction of which the opening is increased or dimin-

ished. These apertures are called STOMATO, and appear to subserve the functions of *respiration* and *evaporation.* They are found in the soft green tissue of leaves and young shoots, but may also be detected in the flowers.

20. GLANDS are organs designed to elaborate peculiar secretions from the vegetable fluids, such as the fragrant volatile oil of the sweet briar, and the acrid, colorless fluid of the nettle. They are found in all parts of plants, and are of various forms and composition. Some being composed merely of cellular tissue, while others contain, in addition, a number of vessels of different kinds.

21. HAIRS are minute expansions of the epidermis, consisting of single elongated cells, or a row of cells, placed end to end, simple or branched, containing air.

22. PRICKLES are larger expansions of the epidermis, composed of indurated cellular tissue. They have no connection with the wood, being appended to the cuticle alone, and are stripped off with it. Example, rose, raspberry, &c.

23. RECEPTACLES OF SECRETION are analagous to glands, being cavities formed in the cellular tissue. They abound in the rind of the lemon and orange, containing minute drops of a fragrant volatile oil.

ORGANOGRAPHY.

COMPOUND ORGANS OF PLANTS.

24. A plant, in its early rudimentary state, is an embryo contained in the seed. The form of this initial plantlet varies greatly in different species. It is often an oblong or cylindrical body simple at one extremity and notched or lobed at another. Upon this so simple and often minute body, all the laws of vegetable life are impressed, and its first effort when it germinates, is to give expression to the most universal of these laws. The two extremities of the embryo are differently affected by the same external agents, and exhibit exactly opposite tendencies. The one end is absolutely *stem*, the other *root.*

25. The plant, therefore, possesses a kind of polarity, composed of two counterpart systems, namely, an *ascending*

axis, to produce and continue the stem, and a *descending axis*, to form the root. The former is generally ærial, the latter subterranean. Both the stem and root branch; but these branches are only repetitions of the axis from which they spring, and obey its laws. The branches of the former ascend, those of the latter descend. The branches of the stem are produced at definite points, and with a predetermined arrangement, while those of the roots are given off without any particular order. The extremity of the embryo which gives birth to the stem consists of several rudimentary organs, which develope as it developes. It is from the first a bud, or growing point containing the undeveloped rudiments of leaves. As the bud expands, and the stem lengthens, the leaves are successively developed in regular order. The first leaf, or the pair of leaves are termed *cotyledons*, or *seed leaves*.

26. The *root*, *stem* and *leaves* pre-existing in the embryo, in a more or less rudimentary condition, and being the organs concerned in growth, by which the plant takes in nourishment from the earth and air, on which it lives, and elaborates them into the materials of its own organized substance are, therefore, properly termed the FUNDAMENTAL ORGANS of plants, or the ORGANS OF VEGETATION.

27. Plants of the highest organization, such as trees, shrubs, &c., are here assumed as exhibiting the typical plan of vegetation. But this plan is greatly modified, and in most respects simplified, as we descend towards the confines of the vegetable kingdom. Before the tribe of ferns is reached, proper flowers disappear, and consequently seeds containing a ready-formed embryo-plant are no longer found. The mosses, and all below them in the series, are composed of simple cellular tissue. In some hepaticæ mosses, lichens, fungi and algae or seaweeds the distinction between stem and leaves are entirely lost, and even the distinction between stem and root eventually disappears, as in those lichens which present a flat, expanded crust, and adhere to rocks or the trunks of trees by the whole lower surface which answers to a *root*, while the upper surface presented to the light fulfills the office of *leaf*. Thus, the type of vegetation, obscurely shadowed forth in its most reduced form by the fungi, lichens, and sea-weeds, but more plainly sketched in the mosses and ferns, is completely realized in the *higher* or Flowering Plants.

ORGANS OF VEGETATION.

28. The organs of vegetation are the *Root*, *Stem*, and *Leaves*.

THE ROOT.

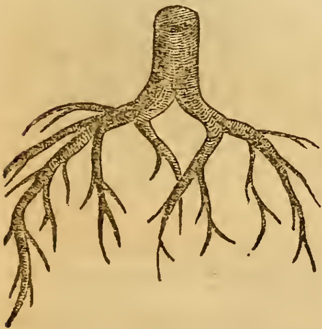
29. The root is the decending axis, which, avoiding the light grows downward, fixing the plant to the soil and absorbing nourishment from it. The different parts of roots consist of the *caudex* (main root) and *fibrils*, (the finer branches which are sent off from the main stock.)

The so called *spongioles* or *spongelets* which were formerly supposed to be the proper growing points, and the organs through which absorbtion takes place, according to Prof. Gray have no existence.*

30. The form of the root is much diversified in different plants, but the following are the principal varieties which have received distinctive names:

31. Ramose (branching) Fig. 8. Divided into numerous ramifications, sent off from the main body like the limbs of a tree, but in no determined order. This is the most common form of the roots of trees and shrubs.

8.



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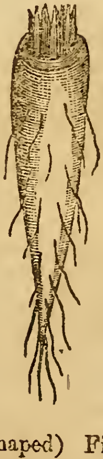

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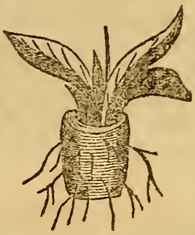

32. Fusiform (Spindle-shaped) Fig. 9. This root consists of a thick fleshy stalk (*caudex*) tapering downwards,

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* Gray's Botanical Text Book; Third Edition, page 82.

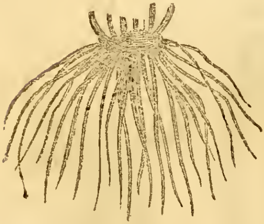
and also for a short space upwards. It sends off from the sides and extremity, thread-like fibrils, which are its true roots. Example *Parsnip*, *Carrot* and *Radish*.

33. NAPIFORM (Turnip-shaped.) This is a variety of the fusiform, where the upper portion swells out, so that the diameter is greater than the length. Ex. *Turnip*.

34. PREMORSE (form *præmorsis* bitten) Fig. 10. This root terminates as though it had been bitten off under the ground. This is due to the fact that the lower extremities perish after the first year. Ex. *Viola pedata*, *Scabiosa*, *succisa* and *Primrose*.

35. FIBROUS ROOT, Fig. 11. This consists of numerous small fibres, sent off directly from the base, sometimes so close together as to form tufts of a downy resemblance. Such are the roots of most grasses, which multiply their fibres exceedingly in a light sandy soil.

11.



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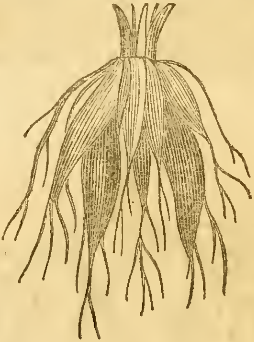


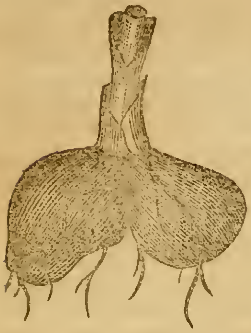
36. FASCICULATED ROOT, Fig. 12. This is a variety of the fibrous root with some of its fibres thickened, as in the Crowfoot (*Ranunculus*,) Peonia, &c.

37. TUBEROUS ROOT, Fig. 13. This consists of a number of fleshy knobs or tubers, situated at the base among the fibres. Ex. Orchis. Tubers which bear buds, such as the Potatoe and Artichoke, were formerly classed among tuberous roots, but are now classed among stems.

38. GRANULATED ROOT, Fig. 14. This is a variety of the tuberous root, consisting of small tubers or knots growing

in clusters, connected by fibres. This variety is sometimes called moniliform from *monile* a necklace. Ex. Wood sorrel, and some of the Grasses.

13.



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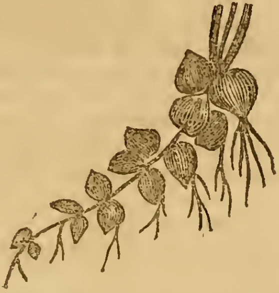


39. Palmate Root, (Hand-Shaped.) This root is also a variety of the tuberous, where the knob is seperated below into oblong tubers, somewhat resembling the hand. Ex. Dahlia and several species of the Orchis.

40. Floating Roots. This root is peculiar to plants which float loosely upon the water. The Lemna (Duckmeat) is an example, it consists of little flat oval green scales, floating on the surface of the water of ditches and stagnant ponds. From the under sides of these proceed the roots hanging like threads of several inches in length. The Calitriche (Water starwort) is another example, it floats upon the surface only until flowering, after which it sinks to the bottom, and ripens its seed.

AERIAL ROOTS.

41. Thus far, the primitive root, that which originated in germination, has alone been considered. But roots often spring from different parts of growing stems of plants, and when formed, they follow the ordinary course, avoiding the light and seek to bury themselves in the soil. Of these roots several varieties are remarkable. 1st. Those which are sent forth from the joints of creeping or climbing plants. The ground Ivy, (*Nepeta glechoma,*) and Twin flower (*Linnæa*) are examples of the former, and the Ivy (Hedera helix,)

Poison Ivy (Rhus toxicodendron,) and Bignonia or Trumpet creeper, are good examples of the latter. Such plants derive their nourishment from their ordinary roots imbedded in the soil, their copious aerial rootlets merely serving for mechanical support. 2nd. The roots of certain erect plants of the endogenous structure, originating from high up the stem in the open air, descend to the ground and establish themselves in the soil. This may be seen on a small scale on the stem of Indian corn, where the lower joints often produce roots of several inches in length before they reach the soil. The Pandanus or Screwpine, a native of the tropical regions (often cultivated in our conservatories,) affords a well known instance. The strong aerial roots emitted from the lower parts of the trunk are often several feet in length before reaching the ground, giving the tree the appearance of being partially raised out of the ground. The famous Banyan-tree affords a still more striking example. Here the aerial roots strike from the horizontal branches of the tree, often at a great height, and swing in the air, like pendent cords, but they finally reach and establish themselves in the ground, where they increase in diameter, forming numerous accessory trunks, which help to support the widespread canopy of branches and foliage.

42. Another class of aerial roots is peculiar to the *epiphytes* or Air-plants; where the roots not only strike in the free air, but throughout their existence have no connection with the soil. They generally grow upon the trunks and branches of trees; their roots merely adhering to the bark sufficient to fix the plant in its position, or else hang loose in the air, from which such plants draw all their nourishment. Of this class are a large portion of the gorgeous Orchidaceous plants of very warm and humid climes, which in their flowers and general aspect, exhibit such fantastic and infinitely varied forms. Some of the flowers resemble butterflies or strange insects, in shape as well as gaudy coloring

43. *Parasites*, or Parasitic Plants not only strike root upon other vegetables, but live at their expense, which Epiphytes do not. The Missletoe is a good example, its roots are at no period connected with the earth, but the seed germinates upon the trunk or branches of the tree where it happens to fall, and the root penetrates the bark and young wood, just as the roots of ordinary plants penetrate the soil; and thus draws the crude sap which the tree has absorbed from the soil, and

digests it in its own foliage. Such plants as the Beach-drops (Orobanche) and Dodder (Cuscuta,) which draw their food from other plants have no occasion for digestive organs of their own, and are therefore, always destitute of green foliage. They may be reduced to a stalk with a single flower or cluster of flowers, as in the different species of Beachdrops, or, even a single flower directly parasitic. A truly wonderful instance of this kind is furnished in the Rafflesia, *Arnoldii* of Sumatra. This gigantic flower which constitutes the entire plant, when expanded is nine feet in circumference, and was found growing directly parasitic on a species of grape vine. Its colour is a light orange, mottled with yellowish white.

FUNCTIONS OF THE ROOTS.

44. The functions of the roots are *absorption*, and the *fixation of the plant in the earth, so as to maintain its posture.* By absorption the roots draw from the soil a portion of that food and moisture which is necessary for their growth of the plant. The activity of absorption depends on the activity of *exhalation*, and while the latter is dependent upon the presence of light and heat, it follows that absorption is in general more powerful by day than by night.

45. The so called *spongioles* and *spongelets* of former Botanists according to Prof. Gray's recent discovery have no existence, but the roots "imbibe the moisture that bathes them by endosmosis, through the whole recently formed surface, and especially by the hair-like prolongations of the exterior layer of cells, or *fibrils* as they may be termed, which are borne by all young roots. These capillary tubes, of great tenuity and with extremely delicate walls, immensly increase the surface which the rootlet exposes, and play a more important part in absorption then is generally supposed, for they appear to have attracted little attention."

46. The use of absorption by the roots is not merely to introduce a certain quantity of water into the plant, but to obtain those mineral substances held in solution by the water, which constitutes an important part of its food.

THE ASCENDING AXIS OR STEM.

47. The stem is that portion of the plant which grows in an opposite direction from the root, seeking the light and air,

and supports the leaves and organs of reproduction. All flowering plants have stems, but in some cases they are so short and concealed under the ground as to appear stemless (acaulescent.) Although stems generally take an ascending direction at first, they do not always retain it but sometimes trail along the ground, or burrow beneath it, sending up branches, leaves, and flowers into the air. In regard to duration, the stem like the root is called *annual* when it lives but one season, and *perennial* when it lives an indefinite number of years.

48. From the size and duration of stems plants are divided into *herbs*, *shrubs* and *trees*.

49. HERBS are plants producing stems, which do not beconme woody or hard, but die down to the ground at the end of the growing season, or after fructification; as the Grasses, Corn and Cucumber.

50. SHRUBS are plants with woody perennial stems, dividing into branches at or near the ground; and not exceeding thirty feet in height. Ex. Alder, Sumach and Lilac. Shrubs of a diminutive size are called UNDERSHRUBS, such as the Whortleberry, Currant, Gooseberry, &c.

51. TREES are plants with woody, perennial stems or trunks, which do not divide into branches at or near the ground, and attain to a much greater age and size than shrubs. Ex. Oak, Elm, Pine, &c.

52. Stems that are too weak to stand erect, are termed *decumbent*, or if trailing *procumbent*, *prostrate* or *running*, and if they strike root at certain intervals, they are called *creeping*.

53. CLIMBING STEMS, are such as cling to surrounding objects for support, whether by tendrils, as the Vine and Passion flower; by the leafstalks, as the Virgins Bower, or by ærial rootlets, as the Poison-oak.

54. TWINING OR VOLUBLE STEMS, are such as elevate themselves by coiling spirally around stems or other objects, as the Morning Glory, Cypress vine, and Hop.

55. A STOLON is a branch which descends from an elevated part of the stem to the ground, there takes root, sends up new shoots and at length becomes a new plant, drawing nourishment directly from the soil. Plants which multiply in this way are called stoloniferous. Ex. Currant, Gooseberry, Raspberry, &c.

56. A SUCKER is a branch proceeding from a subterranean stem or root, producing leaves, flowers, &c., and throwing

out roots from its own base, at length becoming an independent plant. The Rose and Mint afford familiar illustations.

57. A RUNNER is a prostrate, slender branch sent off from the base of the parent stem, extending itself along the surface of the ground, and throwing out roots and leaves at its extremity, which become an independent plant, capable of putting forth new runners in its turn. Ex. Strawberry.

58. An OFFSET is a short lateral branch, with a tuft of leaves at the end, capable of taking root when separated from the parent plant; as the Houseleek.

59. A SPINE or THORN is a short and imperfectly developed branch of a woody plant, contracted into a sharp, rigid point, either simple, as in the Thorn, or compound, as in the Honey Locust. In some species of the Thorn (Cratægus,) and Crab Apple (Pyrus coronaria,) they often bear leaves; and in cultivated trees frequently disappear; as in the Apple, and Pear.

60. A TENDRIL is commonly a leafless thread-like branch capable of coiling itself around contiguous objects, so as to afford support to the stem; a fine example of this beautiful appendage is seen in the Grape Vine and Gourd. But sometimes tendrils belong to the leaves, being a continuation of the midrib of the leaf, as in the Pea Family.

SUBTERRANEAN STEMS.

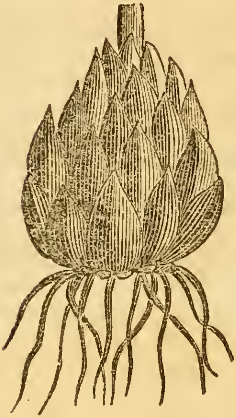
61. The form of stems when subterranean, is nearly as various as when ærial, but they may all be reduced to a few principal types. They may be distinguished from roots by having regular buds, by scars indicating the insertion of former leaves, or by scales which are the rudiments of those organs. All the scaly roots of the older Botanists are therefore forms of the stem or branches, with which they agree in every essential respect: growing likewise, in the opposite direction from roots. The principal modifications are the *bulb, corm, tuber, rhizoma* and *creeper.*

62. A BULB, Fig. 15, is a thickened subterranean bud, generally of a globular form, and mostly furnished with fleshy scales which are the bases of former leaves; producing roots from its base and a flower stem its centre. The scales are sometimes separate, thick, and arranged in several distinct rows overlaying each other, as in the scaly bulb of the lily, sometimes they are broad and thin, or even in the outer mem-

branaceous , and investing each other, in concentric layers, as in the *tunicated bulb* of the Onion.

63. BULBLETS are small ærial bulbs borne in the axils of the leaves, which fall to to ground and produce new plants. The Tiger Lily (Lilium bulbiferum) and several species of the Onion are good examples. Such plants are called bulbiferous.

15.



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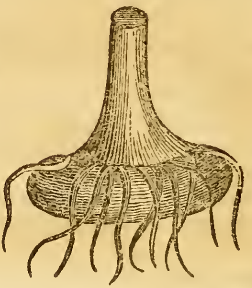
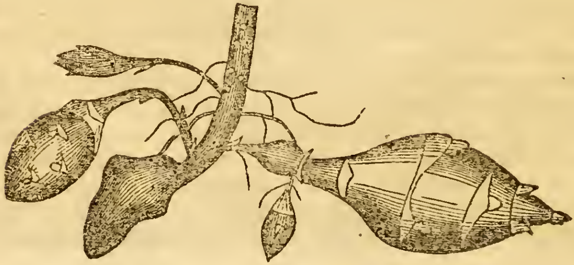


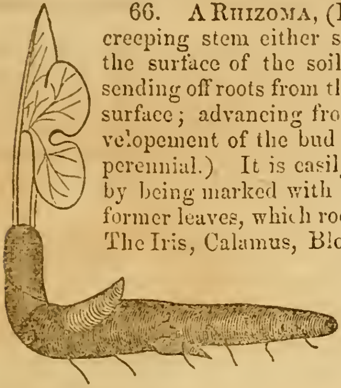
64. A CORM, Fig. 16, is a solid fleshy subteranean stem composed of a simple compact mass, resembling the bulb in form, but without distinction of layers and scales, as in the Indian Turnip, (Arum triphyllum,) Cyclamen Crocus, &c.

17.



65. A TUBER, Fig. 17, is a part of a subterranean stem which is much thickened by the deposition of nutritive matter, provided with latent buds (eyes) from which new plants spring. The common potato and the Jerusalem Artichoke afford familiar examples.

18.



66. A RHIZOMA, (Fig. 18,) is a thick prostrate creeping stem either subterranean or resting on the surface of the soil in a horizontal position, sending off roots from the under side, or the whole surface; advancing from year to year by the developement of the bud at the apex, (being always perennial.) It is easily distinguished from roots by being marked with the scars or scaly bases of former leaves, which roots are entirely destitute of. The Iris, Calamus, Bloodroot and Solomon's-seal afford good examples.

67. The CREEPER, differs from the Rhizoma chiefly in size, consisting of slender creeping branches, exceedingly tenacious of life, extending horizontally in every direction and for considerable distances under the ground, sending out roots and branches at intervals. The Witch-grass (Triticum repens) is an example.

PHYSIOLOGICAL STRUCTURE OF STEMS

68. The stems of flowering plants (as before stated § 9,) are composed of a cellular system, which constitutes the framework of yearly shoots of trees, as well as of annuals, such as the Pea, Bean, &c.; but in the former it becomes strengthened and consolidated in course of time by the deposition of woody fibres and vessels.

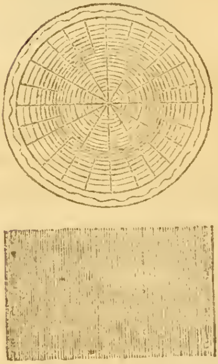
69. Plants differ materially in respect to the arrangement of these fibres and vessels, and in the mode of their increase; but these diversities are reducible to two general plants, which lay the foundation of the first grand distinction of Flowering plants into EXOGENS and ENDOGENS.

70. The difference between the two, as to the structure of their stems, is briefly this. Those of Exogenous plants increase in diameter by the annual formation of a new layer of wood, which is deposited between the preceding layer and the bark; in other words the wood increases by annual additions to the outside. Flowering plants whose stems grow in this way are called Exogenous Plants or Exogens (outside growers.)

71. In stems of the Endogenous structure the new woody matter is deposited within the old, and towards the centre, which becoming more and more occupied with woody fibres as the stem grows older, causes a gradual distention of the whole, thereby increasing its diameter, the new wood pushing the old outward. Accordingly the plants of this division are called Endogens (inside growers.)

EXOGENOUS STEMS.

19.



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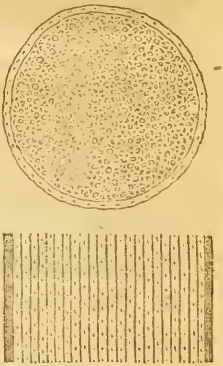

72. The stem of an Exogen, Fig. 19, is composed of three separate parts, the pith, wood, and bark. The pith (medulla,) occupies the centre of the plant, consisting of spongy cellular tissue, at first abounding with nutritive matter for the nourishment of the terminating buds, but as the plant advances in age it becomes dry and much reduced in volume. It is surrounded by a narrow zone of vascular tissue, called the

MEDULLARY SHEATHING, which is composed of woody fibre and spiral vessels and is the only part of the stem in which these latter occur.

73. THE WOOD consists of ligneous fibre, vasiform tissue and ducts, arranged in concentric rows or layers, pervaded by thin, firm, plates of condensed cellular tissue passing from the pith through the medullary sheath to the bark, denominated MEDULLARY RAYS, Fig. 19, which are quite conspicuous in vertical sections of the oak, or the maple, where they are sometimes called *Silver grain.* The number of zones or layers in a stem is in proportion to its age; the first or inner layer of wood, together with the pith and medullary sheath, is the product of the first year; after which one new layer is formed each successive year during the life of the plant, hence the exact age of a tree can be correctly ascertained by counting the layers at the base of a stem.

In the spring when trees are about to recommence their growth, a kind of mucilage appears between the then readily separable bark and wood, which is called the *cambium*, and is supposed to be the nourishment of the forming wood, which becomes organized into cells, and forms a new layer upon the wood and likewise to the inside of the liber.

74. The woody portion is also divided into two parts, the ALBURNUM (sap wood,) and DURAMEN (heart wood.) The first is exterior, new, colorless, and permeable to the circulating fluids; it is usually of a soft structure, and lighter color than the heart wood, and through the vessels of its layers alone the sap ascends. The other is central, denser, impermeable to the fluids, and usually of a darker color, and is by far the most useful in the arts.

75. THE BARK is the external covering of the stem, and at first consists of simple cellular tissue, or parenchyma undistinguishable from the pith, except that it assumes a green color when exposed to the light, from the production of *chlorophyll* in its cells. As the stem increases by external accretions, analogous layers are deposited on the inside of the bark, in the form of tough woody fibre which constitutes the *inner fibrous bark*, or *liber.* This rests directly on the wood. The next cellular portion which covers the liber, occupying the space between it and the epidermis or outside skin, is called the *cellular integument*, and is distinguished into two parts. 1st. The green layer or *cellular envelope*, which is the

only part of the bark that assumes a green color. 2nd. The *corky envelope*, which lies next to the epidermis, and is generally of a brownish or ash color. It is sometimes very thick as in the Cork-oak (Quercus suber) forming that useful substance called Cork. The *epidermis* or outside cuticle, though smooth and entire at first, at length becomes shaggy and rough, with longitudinal ridges, which are sometimes cut off, as in the Hemlock, Walnut, Hickory, &c. Sometimes however, the older layers are extended in horizontal grains, or fibres, encircling the stem, as in the White Birch (Betula papyracea.)

76. The peculiar virtues or medical properties of trees reside in the bark rather than in the wood, and is therefore the part chiefly used for dying, tanning, medicine, &c.

ENDOGENOUS STEMS.

77. The stem of an endogenous plant, (Fig. 20,) presents no distinct separation into pith, wood and bark; nor does a cross-section exhibit any concentric arrangement of layers. The woody portion consists of cellular tissue, existing equally in all parts of the stem, in which is imbedded woody fibre, spiral vessels, and ducts, in the form of threads or bundles. These fibrous bundles arise from the leaves and pass downward towards the centre of the stem, and gradually force outwards those which were first formed. In this way the external part of the stem becomes extremely dense and hard, even so as to resist the stroke of an axe, as in the Palms. Accordingly, contrary to the exogenous stem the newest and softest wood is formed towards the centre, while the oldest and hardest occupies the circumference. The age of most endogenous trees, such as the Palms, are therefore limited by this peculiar mode of growth, the stem increasing in diameter as long as the rind is capable of distention, further increase being impossible.

78. Palms, &c., generally grow from the terminal bud alone, and perish if this bud be destroyed; the foliage is also borne at the summit of the trunk; which consequently forms a simple cylindrical column.

79. The Green-briar affords a good illustration of a woody stem of the endogenous structure, and is the only one indigenous to the Northern United States. An Asparagus shoot and a stalk of IndianCorn furnish fine herbaceous illustrations.

80. The hollow stems (culm) of grasses are originally solid and of the ordinary endogenous structure; but they soon become hollow by the surface growing faster than the centre, except at the closed nodes, where the woody threads are complicately entangled so as to form a solid joint.

BUDS.

81. Buds are undeveloped branches or terminations of stems, enveloped in dry closely packed scales, being the rudimentary leaves of the preceding year, formed late in the season, and arrested in their growth by the frosts and scanty nutriment, which in this form serves for protection from the effects of moisture and sudden changes of temperature during their dormant state.*

82. Buds are of two kinds, namely, the *leaf-bud,* containing the rudiments of a leafy branch; and the *flower-bud,* containing the same elements transformed into the organs of a flower for the purpose of reproduction.

ALL BUDS ARE EITHER TERMINAL OR AXILLARY.

83. Terminal Buds are those which appear at the apex of the stem when it has completed its growth for the season. They often exhibit in miniature the whole plan and amount of the next year's growth; the nodes and even the leaves they bear, being already formed, and only requiring the elongation of the internodes for their full expansion. As the stem is from a bud, so, at the close of the season, it is again terminated with a similar one, which repeats the same process.

84. The Lateral or axillary Buds are new axis of growth; when they grow, they give rise to *branches;* which are repetitions, as it were from the main stem, growing as that did from the seed. The branches thus produced are in turn provided with similar buds in the axils of their leaves and

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* That the bud scales are of the nature of leaves will appear very evident to any one who attentively observes the expanding buds of the Horse Chestnut, or the Lilac. Buds are only furnished with scales in wintry climates. In the Torrid Zone, or in hot houses where the temperature is equalized through the year, plants develope their buds into foliage after their formation without clothing them in scales. In annual plants, the buds are likewise destitude of scales, not being destined to survive the winter. In some trees the scales of the buds are clothed with a thick down, in others, as in the Horse Chestnut, Balm of Gilead, and other species of the Poplar, the buds are covered with a viscid and aromatic resin, resembling a coat of varnish.

occupy the same relation to the primary branch, that they do to the main stem, and are capable of developing into branches of a third order, and so on indefinitely, producing the whole ramification of the plant. The whole is merely a series of repetitions, from new starting points, of what took place in the evolution of the first axis, prexistant in the seed.

85. The arrangement of axillary buds depends upon that of the leaves, which, in all young plants are arranged with great symmetry and order. When the leaves are *opposite,* the buds in their axils are consequently opposite, as in the Horse Chestnut. When the leaves are *alternate,* the branches will be alternate, as in the Oak, Poplar, &c.

86. It is a fixed law in the arrangement of the leaves, and all other appendages, that they are disposed SPIRALLY, that is in a line which winds around the axis. This spiral line is formed by the union of two motions, the circular and the longitudinal, caused by the advancement in length and increase in diameter of the axis while in a growing state. When a single leaf arises at a node the arrangement is more obviously spiral, and is said to be *alternate.* When two arise at each node they are placed *opposite* to each other, and at right angles to the adjacent pair. When *more than two* arise at each node, they are said to be verticellate or whorled. So likewise the arrangement of the branches (when not interfered with by some disturbing causes) is found to be SPIRAL; that is, alternate in most plants, *opposite* in the Ash, Dogwood, &c. or *verticellate* in the Pine, &c.

87. Buds may be removed and attached to the trunk of another individual of the same, or even of a different, but nearly related species, where they will grow equally well. This is directly accomplished in *budding* and in *grafting,* in the latter however a portion of the shoot on which it grows is transferred with it. Buds may even be made to strike root, by plunging them into the soil, from which they immediately draw their nourishment, instead of the parent plant. In this way Horticulturists propagate plants, with all their varieties and individual peculiarities, many of which would doubtless be lost in raising from the seed.

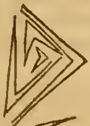
VERNATION.

88. The peculiar manner in which the young leaves are folded in the bud, is called VERNATION, which varies consid-

erably in different species and is exhibited in a most interesting manner by making a cross section of a bud with a sharp instrument while in a swollen state, before expansion.

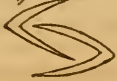
Some of the principal forms of vernation are the following:

1



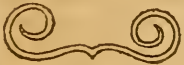
1. Equitant, overlapping each other in the form of angles, the folds of each side being parallel with each other, as in the leaves of the Iris.

2



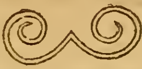
2. Obvolute, (embracing each other) where one of the margins of each leaf is interior and the other exterior to the margin of the opposite leaf, as in the Vallerian &c.

3



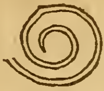
3. Involute, having the edges rolled inward, as in the Apple, Violet, &c.

4



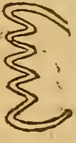
4. Revolute, having the margins rolled outwards or backwards, as in the Willow, Rosemary, &c.

5



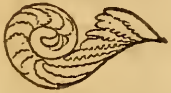
5. Convolute, when the leaf is wholly rolled up from one of its sides, as in the Cherry, and most of the grasses.

6



6. Plaited, where each leaf is folded like a fan. Ex., Vine, Birch, and Palm-tree.

7



7. Circinate, when rolled downwards from the apex. Ex., Sundew, Ferns, &c,

LEAVES.

89. Leaves are by far the most conspicuous portion of plants, and are of the highest importance to the vegetable fabric; being the organs of *respiration* and *assimilation*. They

generally consist of thin membraneous expansions of various forms, growing from the stem or branches situated immediately below the bud. They may be considered as an expansion of the skin or cuticle of the plant, supported by a network of fibres and vessels derived from the medullary sheath presenting the largest possible surface to the action of the air and light, which is indispensable to the life and increase of the plant.

90. Leaves are almost universally green, which of all colors is the most agreeable to the eye, the intensity of which varies by an infinite variety of shades, which form a beautiful contrast with the more delicate tints of the flowers. The coloring matter of the leaves consists of innumerable rounded globules of a waxy nature, called *chlorophyll,* adhering to the inside of the cells upon which the light has its peculiar action.

ARRANGEMENT.

91. The point of attachment of leaves, (or other organs) with the stem is termed their insertion; simply the point of adhesion.

92. In regard to the position on the stem, leaves are said to be *radical,* when they are inserted into the stem at or below the surface of the ground as in in the Cowslip, Primrose, and some of the Violets. Those that arise along the main stem are termed *cauline,* and those that belong to the branches are called *rameal.*

93. As to their situation with respect to each other, they are said to be

1. ALTERNATE, when they arise one above another at regular distances around the stem. They are seldom placed one above the other on exactly opposite points of the stem, but the second leaf will be found to arise a little to the right or left of the opposite point, and the third a little on one side of the perpendicular of the first, and it is only when we reach the sixth leaf, that we find one placed exactly over the first. Ex. Apple, Peartree, &c.

2. OPPOSITE, when placed in pairs on opposite sides of the stem. Ex. Ash.

3. VERTICELLATE, or WHORLED, when more than two arise from the same nodes forming a *whorl* or verticel, around the stem as in the Low Cornel, (Cornus Canadensis) and Meadow Lily.

4. Fasciculate, or *tufted*, when in several crowded whorls forming a spire (fascicle). Ex. Calitriche.

CONFORMATION OF LEAVES.

94. The various forms which leaves assume in different species are almost infinite; affording some of the readiest as well as the most certain marks for distinguishing one species from another.

95. Leaves consist of an expanded surface called the Lamina, Limb, or Blade, and an unexpanded part, or stalk called the Petiole. But when the leaves expand immediately on leaving the stem, the petiole of course is wanting, they are then said to be sessile.

96. Leaves are *clasping* (amplixicaul,) when the base embraces or nearly encircles the stem; *perfoliate*, when the encircling base unites around on the opposite side so as to appear as if perforated by the stem, as in Uvalaria perfoliatum; *connate* when the bases of two opposite leaves are united, as in Bonesett; *sheathing* when the lower part enwraps the stem, as in the Grasses, and *decurrent* when a portion of the blade of a sessile leaf appears to run down along the stem below the point of insertion.

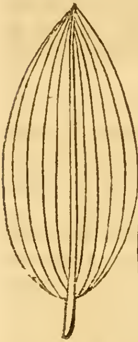
97. A leaf is *simple* when it consists of a single piece, however incised, cut or divided; and *compound* when composed of two or more separate portions or small blades, in other words, when the petiole is branched. In a truly compound leaf the separate blades or *leaflets* are generally *articulated*, (jointed) with the main petiole, and fall off separately just as the petiole separates from the stem, as in the Walnut, while the divisions of a simple leaf, however deep they may be, never fall off separately.

VENATION.

98. The projecting lines on the under surface of a leaf are termed *veins*, and their distribution *Venation*. The veins are distributed through the blade in two principal modes, called the *parallel-veined*, and the *reticulated* or *net-veined*. In parallel-veined leaves (Fig. 21.) the veins divide at once where they enter the blade and run parallel with each other to the apex, connected only by simple transverse veinlets; or the petiole is continued into the blade in the form of one or more principal or coarser veins, which send off smaller veins on both

sides, running parallel with each other, connected by simple transverse veinlets, (Fig. 22.)

21.



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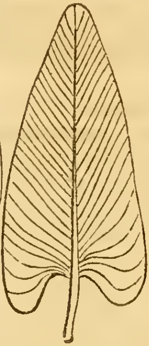

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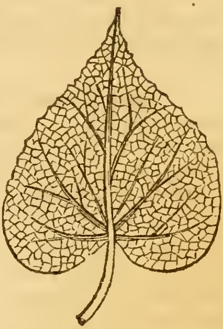

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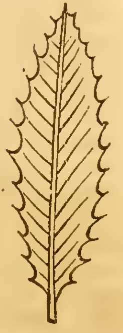


99. Parallel-veined or nerved leaves are characteristic of Endogenous Plants; while reticulated leaves are almost universal in Exogenous Plants.

In reticulated leaves the petiole is prolonged into the leaf in the form of the midvein or several primary branches, dividing and subdividing into branchlets, which unite again, and, by their frequent inosculations, form a kind of network, as in Fig. 23.

100. There are two varieties of reticulated leaves that deserve particular attention, the *feather-veined* and *radiate-veined.* In the feather-veined leaf, (Fig. 24) a single strong rib forming a continuation of the petiole runs directly through the middle of the blade to the apex, giving off at intervals lateral veinlets, as in the Beech, Chestnut, &c. In radiate-veined leaves (Fig. 23) the vessels divide at the apex of the petiole into three or more portions or ribs of nearly equal size, which are usually divergent, each giving off veins and veinlets like the single rib of a feather-veined leaf. Ex. Maple.

FORM OF LEAVES.

101. The form of leaves may be considered to depend upon the distribution of the veins, and the quantity of parenchyma. Since it is through the veins alone that the nutriment is conveyed for the development and extension of

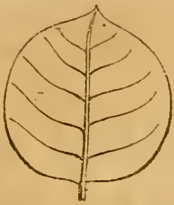
the leaf, it follows that there will be the greatest extension of outline where the veins are largest and most numerous.

FEATHER-VEINED LEAVES.

102. If the principal vein of a feather-veined leaf are not greatly prolonged, and are somewhat equal in length, the blade will have a more or less elongated form.

Middle veinlets longest.

25.



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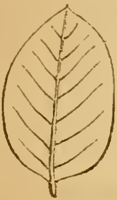

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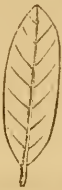

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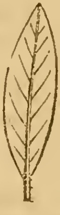


1. Orbicular (roundish, Fig. 25) having the longitudinal and cross diameters nearly equal. It is very rare, if ever, that precise examples of this leaf occur in nature. Pyrola rotundifolia and Anagalis (Pimpernel) afford tolerable examples.

2. Eliptical (oval, Fig. 26) having the length greater than the breadth, with the curvature equal at both ends. Ex. Lespedeza prostrata.

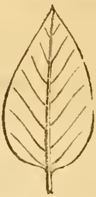
3. Oblong (narrow oval, Fig. 27) having the length several times more than the breadth, with the curvature nearly equal at both ends. Ex. Solomon's seal, Side-flowering sandwort.

4. Lanceolate (lance-shaped, Fig. 28) having the length three or four times longer than the width, tapering towards both extremities, and ending in a sharp point. Ex. Peach.

Veins next the base longest.

1. Ovate (egg-shaped, Fig. 29) having the form of an egg divided lengthwise. The length is no more than the width, and the base is broader than the apex. Ex. Chequerberry (Mitchella repens,) Pear.

29.



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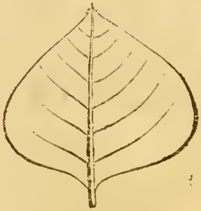


2. Rhomboid or Deltoid (Fig. 30) triangular in outline with the two lateral angles rounded. Ex. Trillium, Black poplar.

Veins developed beyond the middle of the blade.

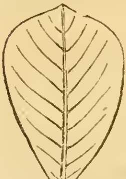
1. Obovate (inversely egg-shaped, Fig. 31).

2. Spathulate (shaped like a spatula, Fig. 32). Ex. Daisy.

3. Cuneate (wedge-shaped).

4. Panduriform (fiddle-shaped, Fig. 33) rather long, broad at the two extremities, and narrow towards the middle. Ex. Bindweed (Convolvulus panduratus).

31.



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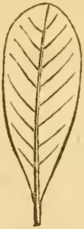

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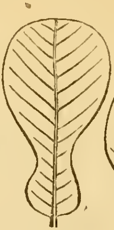

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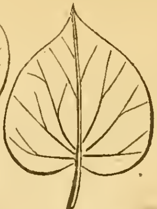

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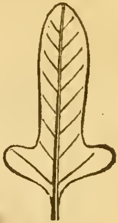


Lowest veinlets longest sending off veinlets backwards.

1. Cordate (heart shaped, Fig.34) where the length is greater than the width, with an ovate form, and hollowed at the base. Ex. Morning Glory, Lilac.

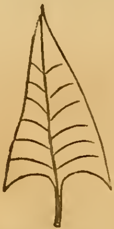
2. Auriculate (Fig. 35) where the form is oblong with two opposite lobes at the base. Ex. Sage.

3. Hastate (halbert-shaped, Fig. 36) when the form is triangular the base spreading and ending in two opposite points, with the sides a little hollowed. Ex. Bittersweet.

4. **Sagittate** (arrow-shaped, Fig. 37) where the leaf is triangular in outline with pointed descending lobes at the base. Ex. Scratch-grass (Polyganum sagittatum,) Arrow-head.

5. **Reniform** (kidney-shaped, Fig. 38). A broad leaf rounded at the apex, and hollowed out at the base. Ex. Coltsfoot (Asarum), Gill-over-the-ground (Glechoma).

36.



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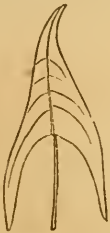

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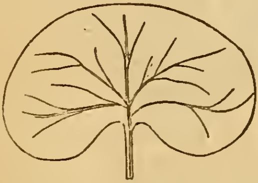
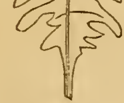


Veinlets nearly of an equal length, with an imperfect developement of the tissues between them.

1. **Runcinate** (lion-toothed, Fig. 39) having the margins cut into transverse acute segments, which turn backwards. Ex. Dandelion.

2. **Lyrate** (lyre-shaped, Fig. 40) when the sides are cut into several lobes or segments of which those next the petiole are the smallest. Ex. Lyre-leaved Sage, White mustard (Sinapis alba).

39.



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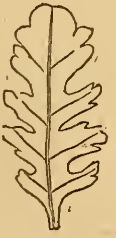

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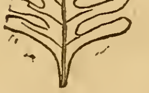


3. **Sinuate**, cut into rounded lobes, or wide open rings between the veinlets, with the margin bending in and out. Ex. Black and White oak.

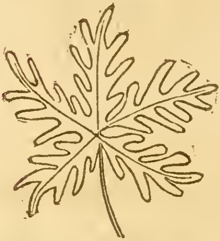
4. **Pinnatifid**, (feather cleft, Fig. 41) where each margin of the leaf is variously divided into oblong parallel segments. Ex. Cardamine hirsuta.

RADIATE VEINED LEAVES.

103. *Radiate* or *palmate veined leaves* assume various forms, which depend upon the number of the veins, their direction, and the quantity of intervening tissue.

1. **Laciniate** (gashed, Fig. 42) cut into numerous, irregular portions or lobes, which are again subdivided. Ex. Crowfoot, Cranesbill.

42.



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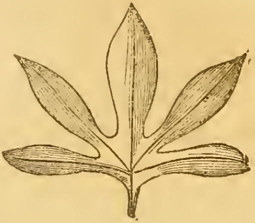
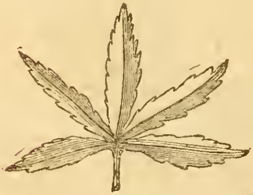


2. **Palmate** (palm-shaped, Fig. 43) divided nearly to the insertion of the petiole into five oblong lobes of similar sizes, so as to resemble the palm of the hand with the fingers. Ex. Passion flower (Passi-flora cœrulia,) Castor oil plant.

3. **Digitate** (finger-shaped, Fig. 44) divided into deeper and narrower segments than the palmate. Ex. Horse chestnut, Hemp.

44.



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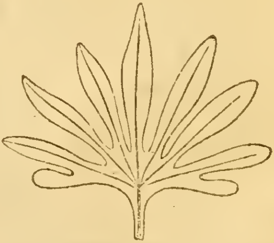
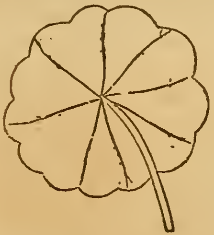


4. **Pedate** (foot-shaped, Fig. 45) similar to the palmate except that the two lateral lobes are again divided. Ex. Viola pedata.

5. Peltate (shield-shaped, Fig. 46) where the petiole is inserted near the middle of the leaf, and the veins radiate from it in every direction, connected by intervening tissue. This form is generally *orbicular* in outline. Ex. Nasturtion (Tropeilum), Podophyllim.

46.



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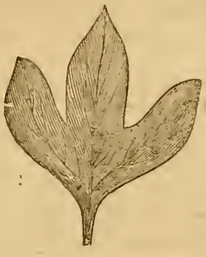


6. Lobed (Fig. 47) divided into segments, the margins of which are rounded. Ex. Liverleaf, (Hepatica).

104. PARALLEL VEINED OR NERVED LEAVES.

Veins parallel from the base to the apex.

1. Linear, straight, and narrow, when the edges are parallel, as in the Grasses. This form also occurs in feather-veined leaves by an equal developement of all the veinlets as in Linaria vulgaris (Toad Flax.)

2. Ensiform (sword-shaped) as in the Flag (Iris versicolor.)

3. Acerose, (needle-shaped) as in the Pines.

105. When the veins *diverge* from the middle, the leaf becomes *Lanceolate* as in the Orchis. Oblong as in the Cypripedium.

Curvinerved Leaves.

106. When the simple parallel veins or nerves arise from a prolongation of the petiole in the form of a thickened midrib, they are called *curvinerved,* as in the Pontederia and Ethiopian Lily (Calla).

COMPOUND LEAVES.

107. A compound leaf consists of several leaves or *leaflets* attached to the common petiole by articulation, distinct from each other and falling away separately.

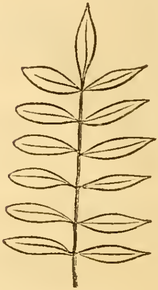
Feather-veined Compound leaves.

108. When a feather-veined leaf becomes compound, a

pinnate (winged) leaf (Fig. 48) is produced. The petiole bearing a row of leaflets on each side, generally equal in number and opposite.

1. Unequally pinnate, (Fig. 48) when a pinnate leaf is terminated by an odd leaflet. Ex. Rose, Ash, Walnut. When it is terminated by a tendril it is called *cirrhose* as in the Pea.

48.



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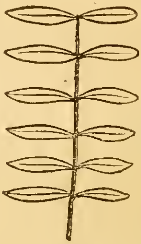

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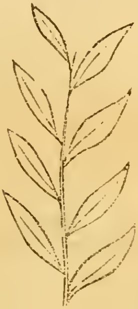
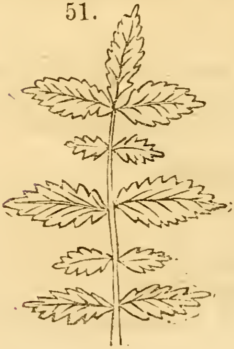


2. Abruptly pinnate, (Fig. 49) when the petiole of a pinnate leaf ends without an odd leaflet or tendril. Ex. Senna, (Cassia Marilandica.)

3. Alternately pinnate, (Fig. 50) when the leaflets alternate with each other on opposite sides of the petiole. Examples rare, Wood Vetch.

4. Interruptedly pinnate, (Fig. 51) when the leaflets are alternately large and small. Ex. Agrimony, Avens.

51.



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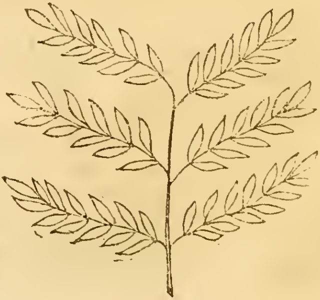
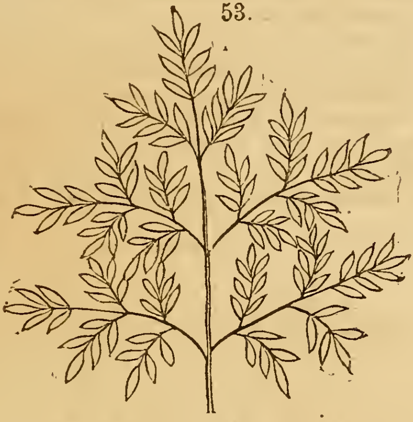


A pinnate leaf sometimes consists of as many as twenty or even fifty leaflets, as in the Acacia.

5. BIPINNATE, (doubly pinnate, Fig. 52) when a common petiole bears pinnate leaves on both of its sides. Ex.: Wild Elder (Aralia hispida.)

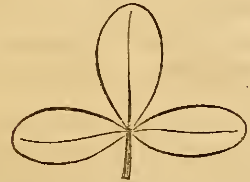
6. TRIPINNATE, (triply pinnate, Fig. 53,) when the common petiole bears bipinnate leaves on each side. Ex.: Angelica tree, (Aralia spinosa).

53.



109. Sometimes the number of leaflets is but three, and the leaf becomes pinnately trifoliate, (Fig. 54,) and is readily distinguished by having the two lateral leaflets attached to the petiole at some distance below its apex, as in the common Garden Bean. Such a leaf may even be reduced to a single leaflet, as in the Orange.

54.



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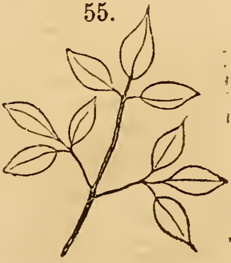


Radiate veined Compound leaves.

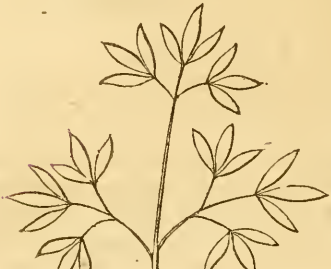
110. When a radiate veined leaf becomes compound, the leaflets are necessarily all attached to the apex of the common petiole, forming a ternate or *palmately trifoliate* leaf, as in Clover, (Fig. 54,) or a *digitate* leaf, as in the Horse chestnut, (Fig. 44).

1. Biternate, (twice ternate, Fig. 55,) when the leaflets of a ternate leaf become themselves ternate. Ex.: Squirrel corn (Dicentra Canadensis.)

2. Triternate, (three times three ternate, Fig. 56,) when the leaflets of a biternate leaf become again ternate. Ex.: Columbine (Aquilegia Canadensis.)

3. Digitate leaves, of five, seven, or any definite number of leaflets, are termed *Quinate, Septinate, &c.;* or *digitately five foliate, seven foliate, &c.* By this nomendature, the distinction between pinnate and digitate leaves is readily understood.

56.



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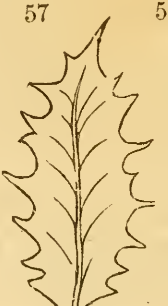

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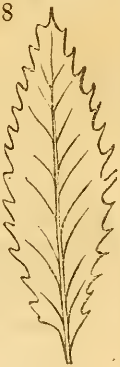


MARGIN.

111. The margin of a leaf may be entire, indented, bordered, or rolled; and is modified chiefly by the same causes which effect the form; being,

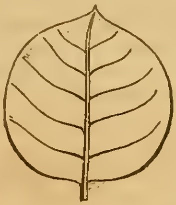
1. Dentate, (toothed, Fig. 57,) when the margin is beset with projecting, horizontal, distant teeth. Ex.: Centaury, Enchanter's Nightshade. *Denticulate*, when the teeth are very fine; and *doubly dentate*, when the teeth are themselves toothed.

2. Serrate, (Fig. 58,) when the margin is beset with sharp teeth, pointing toward the apex of the leaf, like the teeth of a saw. Ex.: Rose, Beach. *Serrulate,* when the serratures are very small; and *doubly serrate* when they are themselves serrate.

1. Entire, (even edged, Fig. 57,) when the line of the margin is uninterrupted. Ex.: Lily, Lilac.

2. Crenate, (Fig. 58,) when the indentations are blunt and rounded, and do not incline to either extremity of the leaf. Ex.: Ground Ivy, (Glechoma.) Crenulate, when such notches are very small, as in the Sage.

59.



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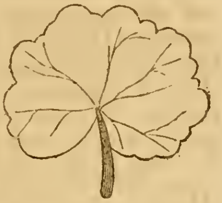


5. Erose (gnawed,) when the margin has the appearance of being bitten by insects, though not so in reality. Ex.: Fireweed.

6. Spinose (armed,) when the marginal denticulations, whatever form they assume, are terminated with sharp, rigid spines. Ex.: Thistle, Argemone.

7. Undulate (wavy,) when the margin rises and falls like waves. Ex.: Amaranthus.

8. Laciniate (torn,) divided by deep and irregular gashes.

9. Crisped, when the margin is variously curled and twisted. Ex.: Crisped Mallows.

10. Revolute, when the margin is rolled backward, or upon the under surface. Ex.: Rosemary, Thyme. *Involute,* when rolled forward, or upon the upper side.

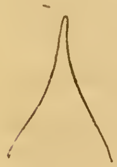
APEX.

112. The apex of a leaf is that part which is opposite to the base or footstalk. It varies considerably in shape in different leaves. It is said to be—

1. Acute, when it terminates with an acute angle.

2. Acuminate, (Fig. 61,) when it ends with a long tapering point.

61.



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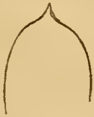

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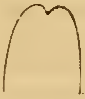

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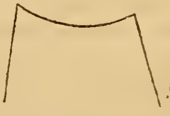

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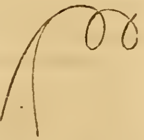


3. Cuspidate, when it runs out gradually into a small, awl-shaped, rigid spine.

4. Mucronate (Fig. 62,) when it ends abruptly in a short, hard, crusty point.

5. Emarginate (Fig. 63,) having a small notch in the end.

6. RETUSE, terminating with a round end, having the centre depressed.

7. OBTUSE, when it is rounded.

8. TRUNCATE (Fig. 64,) when it appears as if cut across in nearly straight lines, as in the Tulip, Poplar.

9. CIRRHOSE (Fig. 65,) when it is terminated by a kind of tendril.

SURFACE.

113. The surface of a leaf comprehends both the upper and the under side. The upper surface is generally the smoothest, although the veins can be traced in the form of white or colored lines; yet they very rarely produce those elevated ridges which are generally so prominent on the under surface. In treating of the different characters that distinguish the surfaces of leaves, the upper disk only is alluded to. The greater number of the following terms are equally applicable to the surface of the stem as to that of the leaf, when the contrary is not expressed.

114. The different forms which are exhibited by the *transverse* sections of leaves are said to be—

1. CHANNELED, when an oblong or linear leaf is longitudinally hollowed, and a transverse section of it is a semi circle.

2. CARINATE (keeled,) when a transverse section is angular, and the midrib on the under surface resembles the keel of a boat.

3. SULCATE (furrowed,) when instead of one longitudinal hollow there are several linear depressions.

4. STRIATE (streaked,) when the depressions are superficial, very narrow, and in parallel lines.

5. PLICATE (folded,) when the surface rises and falls alternately, in straight angular furrows, like the folds of a fan.

6. RUGOSE (wrinkled,) when the tissue between the reticulated veins rises upwards in a convex form, as in the Sage, Cowslip.

7. PITTED, when on the contrary the fulness between the veins produces depression.

115. The different *protuberances* with which some leaves are covered, are said to be—

1. SCABROUS, when they are small, hard tubercles, more easily distinguished by the finger than the eye.

2. VERRUCOSE (warty,) when the tubercles are much larger and more solid.

3. PAPILLOSE (pustular,) when they are evidently elevations of the cuticle, filled with aqueous fluid, as in the Ice plant.

4. MURICATE, when the surface is studded with short, herbaceous spines, or points.

116. When leaves are covered with hairs, or down, they are said to be—

1. HISPID, if beset with short, stiff hairs.

2. SETOSE, when they stand singly, and resemble bristles.

3. STRIGOSE, if they are firm, and stand upon small prominences.

4. HIRSUTE, when the hairs are longer and less rigid.

5. **Pilose**, when the hairs are soft, distinct, and somewhat long and bent.

6. **Villose** (velvety,) when they are soft, nearly erect, and parallel.

7. **Pubescent**, covered with soft hairs or down.

8. **Hoary**, white, with very short dense hairs. (Gnaphalium.)

9. **Tomentose**, when they are very soft and matted together, so that the individual hairs are not distinguishable.

10. **Woolly**, when they are also matted together, but yet individually distinguishable. (Mullein.)

GLANDS.

117. When the surface of a leaf is furnished with visible glands, they are said to be—

1. **Glandulose**, when they are elevated or on pedicels.

2. **Punctate** (dotted,) when a leaf is covered with pellucid spots which either penetrate the substance, or are merly superficial.

3. **Viscid**, when a leaf is covered with a moist, tenacious, glandular secretion, as in the Cuphea viscosissima.

4. **Farinose**, when it is covered with a very fine, dry, mealy powder, devoid of gloss, and easily wiped off.

PETIOLE.

118. The form of the petiole is rarely round, but is usually half cylindrical, and channeled on the upper side. It is said to be—

1. **Compressed**, when it is strongly flattened in a vertical direction, as in the Aspen Poplar, in which the leaves are put in motion by the slightest breeze.

2. **Winged**, when it is expanded into a border, as in the Orange; which not unfrequently extends along the stem, as in the Sweet Pea.

3. **Saccate**, when the base is dilated into a broad, membranaceous, inflated sheath, as in many of the Umbelliferae.

4. **Sheathed**, embracing the stem, as in many of the Grasses. In the true Grasses, it is furnished at the summit with a membraneous appendage called the *ligule.*

119. The apex of the petiole sometimes terminates in a *tendril;* as in the Pea tribe. In the Lathyrus Aphaca, the whole petiole becomes a tendril, the office of the leaf being fulfilled by a pair of large stipules.

120. In some plants, the lamina of the leaf is abortive, and the petiole is dilated, into a kind of nerved leaf, called *phyllodium,* which is readily distinguished from a true lamina by being entire and parallel veined, while the true leaves of the genera in which phyllodia occur are usually compound and net-veined. They generally present the margins instead of their surfaces to the earth and sky; as in the Australian Acacia, in which they sometimes bear a true compound leaf at the apex.

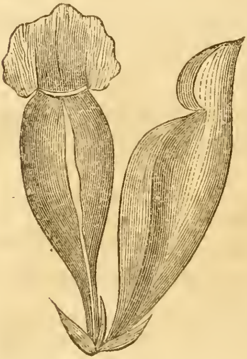
CAULINER AND FOLIAR APPENDAGES.

ASCIDIA.

121. The most remarkable of all cauliner and foliar appendages, are those which are hollowed out into the form of pitchers or *ascidia*.

122. The Side-saddle Flower (Sarrecenia purpuria, Fig. 66,) a North American plant, found growing in peat bogs, bears pitchers which are evidently formed by the very deep channelling of the petiole, and the union of the involute edges of its winged margin, so as to form a complete vase, with a broad expansion at the tip, which may be regarded as the true leaf. These pitchers are always full of water, making an ocean in which many aquatic insects take up their abode. These are often visited by flies and other insects, who would gladly retreat from their prison, but are prevented by the deflexed hairs at the mouth.

66.



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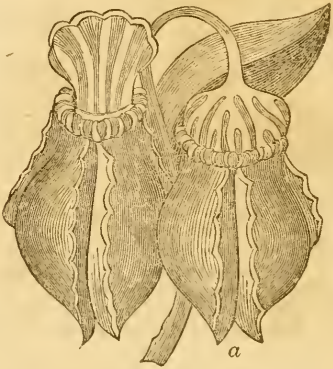


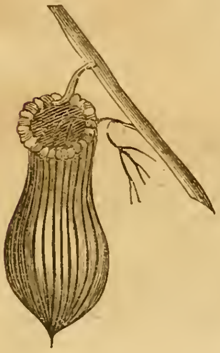
CAULINER ASCIDIUM.

123. The Cephalotus follicularis, an Australasian plant, bears pitchers, which grow entangled with the leaves of the plant, forming a circle around the base of each footstalk. It hangs on a curved, projecting petiole; but supported in such a manner that its cavity is upright. The pitcher itself (Fig. 67,) is nearly egg-shaped, an inch in length, and furnished with a lid. The outside is ornamented with three double costæ (*a*) proceeding from a crested lip. These costæ are projecting, with acute pilose margins, and extend downwards below the bottom of the pitcher. The mouth consists of a ring which gives origin to a number of parallel rib-like processes, which are curved inwards over it by their upper extremities. The greater part of the inside is shining, and of a beautiful dark purple color. The lid, which is produced from the petiole, and attached to the edge of the pitcher by a broad base, is slightly pubescent on the outside, smooth within, and of a green color, painted with broad, branching, dark purple veins. "The pitchers are generally half filled with a watery fluid, in which great numbers of a small species of ants are frequently

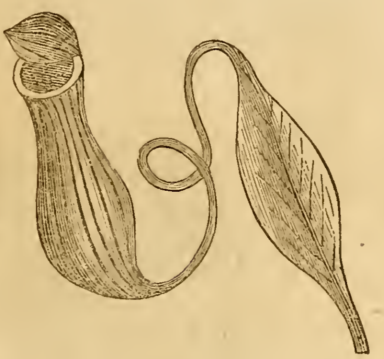
found drowned. This fluid, which has a slightly sweetish taste, may possibly be in part a secretion of the pitcher itself, but *more probably* consists of rain water received and preserved in it. The lid, in its full grown state, is found accurately closed, or standing erect, therefore, leaving it entirely open. It is not unlikely that the position of the lid is determined by the state of the atmosphere, or even by other external causes."

124. The Dischidia, a twining plant, native of the forests of India, bears cauliner ascidia, presenting at the same time one of the most wonderful provisions in the vegetable kingdom. It is destitude of leaves except near its top, which climbs to the summit of the tallest trees, 100 feet or more in height from its roots. The pitchers (Fig. 68,) are formed of a leaf with its edges rolled toward each other, and adherent; its mouth or upper end is open to receive whatever water may fall into it, of which they always contain a considerable quantity. But the most singular part is its absorbent fibres, resembling ærial roots, which are sent out from the nearest parts of the stem next the pitchers—entwining them, and spreading themselves through the cavity, thus supplying the stem with moisture.

68.



69.



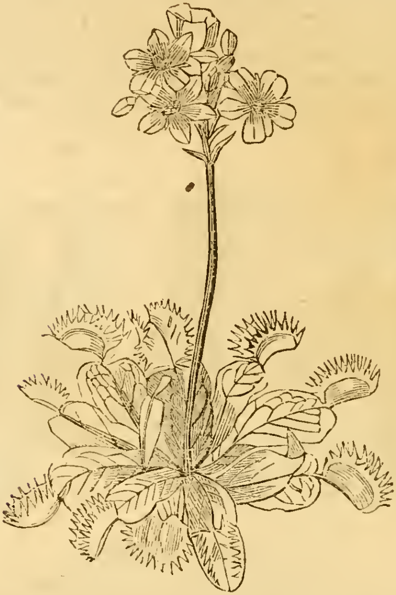
FOLIAR ASCIDIA.

125. The foliar ascidia is peculiar to the genus Nepenthes. In the Nepenthes distillatoria (Fig. 69,) a native of the East Indias, the petiole is first dilated into a kind of lamina, then contracted into a tendril, and finally dilated into a pitcher, furnished with a leafy lid, connected to it by a ligament which expands and contracts according to the state of the atmosphere, being open in damp weather, and closed when the weather is dry. The pitcher, in the early stage of its growth, is of the same color as the leaf; but, as it advances in age, it becomes beautifully colored with dark, purplish-red streaks and blotches. They vary greatly in size, and in some species the pitchers are capable of holding more than a pint of fluid, with which they are generally filled.

126. One of the most extraordinary productions of the vegetable kingdom, is found in the Venus Fly-trap (Dionæa muscipula,) a native of South Carolina. The leaves of this plant (Fig. 70,) are radical, sessile, and nearly spatulate in form; the midrib, however, is produced beyond the apex of the leaf, and supports an appendage which has some resemblance to a steel trap. It consists of two lobes, bordered

with bristly spines resembling teeth. The superior disk of each lobe is studded with minute glands, and furnished with three erect little spines, placed so as to form an equilateral triangle with the apex, pointing toward the midrib which unites the lobes. This appendage is endowed with so much irritability, that as soon as a fly or other insect touches any of the glands, the lobes immediately close upon it, and the spines either impale it, or the teeth on the edges of the lobes, crossing each other, prevent its escape.

70.



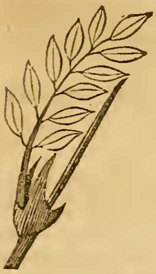
127. Stipules (Fig. 71,) are foliaceous appendages which in some instances accompany the proper leaves, yet are distinct from them; and in others, they are attached to the base of the petiole. They are not universal, but their presence or absence is commonly uniform throughout each Natural Order. They usually have the texture and color of leaves, are subject to the same laws of venation, and perform the same functions. Like leaves, they are sometimes membranaceous, leathery, or spiny. When they are adherent to the petiole, one on each side, they are said to be *adnate,* as in

the Rose, Strawberry, and Clover. Sometimes they are free from the petiole, but adhere by their outer margins, so as to form an apparently single stipule opposite the leaf, as in the Platanus or Button-wood. In other cases, both margins unite, forming a sheath around the stem (called *Ochrea,*) as in the Polygonaceæ or Buckwheat family.

128. In some instances, they are *fugacious,* accompanying the leaves in the bud, and falling away when they expand, as in the Magnolia and Oak families; in others, *decidious,* falling with the leaves, which is the most common occurrence; and in others, again, they are *persistent,* remaining after the fall of the leaves, as in the Cocoloba pubescens.

129. Leaves that are furnished with stipules, are said to be *stipulate*; and when destitute of them, they are *exstipulate.* When the leaflets of compound leaves are provided with small stipules, they are said to be *stipellate,* as in the Bean.

71.



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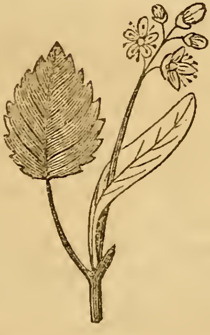


130. Bracts (Fig. 72,)are foliaceous appendages, intermediate between leaves and the floral organs; they appear in the vicinity of the flower, distinct from the perianth, and in some instances exactly resembling leaves, but in others differing from them, both in form and color. In some instances, the gradation from the proper leaves to bracts is scarcely perceptible,.as in the Purple-topped Clarry (Salvia Hominum.) Painted Cup (Castilleja coccinnia,) &c.; but the bract may be truly foliaceous, and yet differ considerable in figure from the leaves of the plant to which it belongs. In the Linden (Tilia Americana,) the leaves are heart-shaped, while the

bracts are linear-oblong, attached to the base of the peduncle, and of a yellowish color.

131. When bracts are arranged in a whorl, surrounding several flowers, they constitute an *involucre,* which is generally green, as in the Phlox, but sometimes is colored, as in the Cornus Florida, and Canadense. When it is situated at the base of a compound umbel, (Fig. 81,) it is called a *general involucre,* and at the base of a partial umbel, a *partial involucre* or *involucel,* both of which are seen in the Umbelliferæ.

132. In compound flowers, the involucre consists of imbricated bracts, often in several whorls surrounding the base of the heads, as the calyx surrounds a simple flower. In the Grass family (embracing Wheat, Rye, Oats, &c.,) the bracts are called *husks,* or *chaff,* to which is attached the *awn,* or *beard.* The bracts situated at the base of a spikelet of flowers, are called the *glume,* corresponding to the involucre.

DURATION OF LEAVES.

133. In view of their duration, leaves are said to be—

1. Fugacious, when they fall off soon after their first appearance.
2. Deciduous, when they last for a single season, and fall in autumn, as the Oak, Maple.
3. Persistent, or Evergreen, when they remain through the cold season, and until after the appearance of new leaves, so that the stem is never leafless, as the Pine, Laurel. Accordingly with the last two distinctions, leaves are said to be *Deciduous* or *Evergreen.*

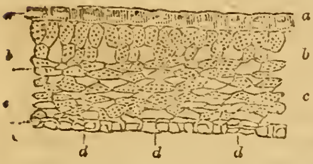
134. Defoliation, or the fall of leaves, is owing to the formation of an *articulation,* or joint between the base of the petiole, and the stem on which it rests. During the latter part of the summer, the tissue of the leaves become gradually choked by the deposition of earthy matter, which obstructs the exhalation, and finally unfits them for the performance of their functions, consequently they lose their vitality, dry up, and are finally cast off.

PHYSIOLOGICAL STRUCTURE OF LEAVES.

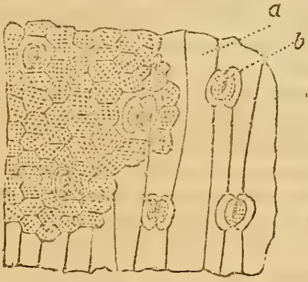
135. The organs of leaves are in general composed of three distinct parts: one part firm, and apparently ligneous, constituting the frame work or skeleton of the leaf, another, succulent and pulpy, fills up the intermediate spaces, or meshes, of this frame work; and a third, a thin, *cuticular* expansion, inclosing the other two, forming the epidermis, or covering for both surfaces of the leaf.

136. The FRAME WORK or vascular portion of the leaf (Fig. 24,) is composed of vascular tissue and spiral vessels, which fulfil the same office in the leaf as in the stem, not only giving firmness and support to the delicate cellular apparatus, but also serving for the conveyance and distribution of the sap. These *veins* divide and subdivide far beyond the limits of unassisted vision, until the threads of woody tissue are reduced to separate fibres ramified throughout the green pulp, so as to supply every portion with the sap they contain, which, having reached the utmost limits of the edge of the leaf, double back upon themselves, pervade the lower surface, and are again collected into the petiole, through which they are finally returned into the bark, constituting the *vessels of the latex.*

73.



74.



137. The CELLULAR PORTION, or parenchyma, exists in two layers, arranged upon a regular plan, which varies in different parts of the leaf, according to the different conditions in which it is placed. In all those leaves which expand horizontally, one surface being turned upwards and the other downwards, these two layers are dissimilar in structure; but in those leaves where the lamina is vertical, as in the Iris, they do not materially differ. The upper stratum is composed of one or more compact layers of oblong cells, placed in such a position that their long diameter is perpendicular to the upper surface, (Fig. 73, *b. b.*) while the lower stratum is composed of oblong cells arranged longitudinally, and so loosely compacted as to leave numerous vacant spaces between the cells (*c. c.*), which communicate with the air by means of the *stomato* or *breathing pores,* (Fig. 74, *a. b.*).

138. The EPIDERMIS of the upper surface, consists of flattened cells, arranged in a single layer (Fig. 73, *a. a.*), except in plants of hot and arid regions, in which case it is often double, and very compact; and in the Oleander, a native of Barbary, it consists of three layers of very thick sided cells. The cells of the epidermis of the lower surface, are also arranged in a single layer, provided with stomato (Fig. 73, *d. d. d.*), opening into air chambers.

139. Within all the vescicles of the parenchyma, are seen adhering to the walls, the green globules called *chlorophyll* (green leaf,) which give color to the parenchyma, dark green above, where it is more compact, but pale beneath, where the cells are more loose and separate.

140. The STOMATO (Fig. 74, *a. b.*), are generally found on the lower surface, except in leaves that have their lower side in contact with the surface of the water, as in the Nymphææ (White Pond Lily,) in which case they are found upon the upper surface; and in those leaves whose position is naturally vertical instead of horizontal, they are found equally on both sides. Through the stomato, exhalation principally takes place; they are situated so as to open directly into the hollow chambers, or air cavities, which pervade the parenchyma, so as to afford free communication between the external air and the whole interior of the leaf. The orifice is guarded by two oblong cells, firmly fixed at their ends, which, when the air is moist become turgid, and in elongating, diverge or curve outwardly in the middle, so as to allow a free communication between the outer air and the interior of the leaf. When the atmosphere is dry, they incline to shorten and straighten, so as to bring the sides into contact, and close the orifice completely. The action and use of this machinery will be readily understood. So long as the leaf is supplied with a sufficiency of moisture, the cells that guard the orifice are expanded, and allow the free escape of moisture by evaporation. But when the supply fails, and the parenchyma begins to be exhausted, the guardian cells quickly collapse, and by closing those thousands of apertures check the drain the moment it becomes injurious to the plant.

141. The number of stomato varies in different leaves, from 800 to about 17,000 on the square inch. The leaf of the Apple is said to contain about 24,000 to the square inch, so that each leaf would present about 100,000 of these orifices.

From their great number, they are doubtless adequate to the office that is attributed to them, notwithstanding their minute size.

FUNCTIONS OF LEAVES.

142. The functions of leaves are *absorption*, *exhalation*, *respiration*, and *assimilation*. By the combined action of these functions, *crude sap*, absorbed from the soil by the roots, is prepared for the nourishment of the plant; carbonic acid—absorbed from the atmosphere and from the soil—is decomposed; solid carbon becomes fixed in the substance of the plant, and oxygen gas is evolved.

143. ABSORPTION is primarily the office of the root, but is carried on to some extent by the leaves. A plant or a part of a plant, exposed in a humid atmosphere, will absorb moisture, and increase its weight, until it dies. In like manner, plants, parched by the droughts of summer, are revived by the showers which moisten their leaves, but do not reach their roots. This is further evinced by the fact that plants having thick and succulent leaves (as the Aloes and Cactus, natives of hot climates, and growing in dry, arid soils,) perspire very little, while they absorb powerfully by the whole surface of their leaves.

144. EXHALATION in plants, in some respects is analogous to insensible perspiration in animals. In this process, the sap becomes concentrated, giving off its superabundant water to the atmosphere, and containing in consequence a greater proportion of solid matter.

Exhalation evidently takes place through the stomata alone; and since these are opened by the influence of the light and closed in the absence, it follows that exhalation can proceed only in the presence of the light.

During active vegetation leaves exhale much water; the quantity varies, however, with the degree of warmth and exposure to the light. A plate of glass, held near the under surface of an active leaf of the Hydrangea, when the atmosphere is still, is presently covered with moisture, but it remains dry if the glass be held over the upper surface. When light is suddenly excluded from a plant in a state of active growth, it immediately ceases to exhale, whatever may be the temperature of the atmosphere surrounding it. The stomata will then, on examination, be found closed.

145. RESPIRATION in plants consists, essentially, in the absorption of carbonic acid gas from the air, and the evolution of oxygen. It is, however, only by a metaphor that this function of leaves can be called respiration, for the evolution of oxygen is a necessary result of assimilation, or the forma-

tion of organic matter, while the respiration of animals is part of the process of decomposition of organic matter.*

The absorption of carbonic acid from the atmosphere, is as necessary to the existence of plants, as is respiration to the support of animal life. Formerly, respiration in plants was considered analogous to respiration in animals, and that plants in respiring, absorb and retain oxygen and evolve carbonic acid, or like them vitiate the atmosphere by their respiration, while they purify it by their digestion. Recent experiments and observations, however, prove this theory to be unfounded. This error arose from the circumstance that plants can only decompose carbonic acid under the influence of light; oxygen is therefore not exhaled during the night, but on the contrary a small quantity of carbonic acid may escape, and oxygen be absorbed, but this process is very different from the respiration of animals; that of plants is mechanical, while that of animals is chemical, both totally unconnected with the assimilation of food. When the soil abounds in carbonic acid and moisture, the roots must continue constantly absorbing that moisture, mixed with the carbonic acid; and this acid, rising into the leaves, may escape in its original state, when light is not present to decompose it. The absorption of oxygen is a chemical process, which appears to go on when the process of assimilation has ceased operating, in dead plants as well as in living ones.

146. ASSIMILATION or DIGESTION in plants consists, properly, in *rendering the crude sap fit for the purpose of nutrition, the decomposition of carbonic acid by the green tissue of the leaves under the stimulus of light, and the fixation of solid carbon.*

147. The sap in its crude state, as imbibed by the roots, is more or less changed in its ascent, by dissolving the soluble. organized matter, with which it comes in contact; thus becoming sweet in the May Apple, and acquiring different sensible properties in different species. By this change, the sap becomes elaborated, and fitted to be consumed in vegetable growth. Sap in a crude state is mere unorganized mineral substance, and thus incapable of composing a part of the living structure.

148. The crude sap is, however, soon converted into an organized substance by the solar light, under whose wonderful influence the vegetable fabric is constructed, and the *chlorophyll*, or green matter of plants, is developed. Plants growing where the light is insufficient, do not develope chlorophyll, as may be seen in the shoots of Potatoes growing in cellars. It will be seen, therefore, that light exerts an important influence on vegetable digestion.

149. Light has also an agency in the essential process of vegetable digestion, by its action upon the sap concentrated in the leaf, and upon the air absorbed in respiration. This agency is exercised, 1st, in the chemical decomposition of one or more of the substances contained in the sap which contain oxygen gas, as well as of the carbonic acid in the air; and by the liberation of the oxygen contained in

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* There is a characteristic difference between vegetables and animals: "The tissue of the latter continues to live and act during the life-time of the animal, and therefore require constant interstitial renewal by nutrition, new particles replacing the old, which are removed and restored to the mineral world by *respiration*; while in plants there is no such renewal, but the fabric once completed, remains unchanged, ceases to be nourished, and consequently soon loses its vitality; while new parts are continually found further on to take their places, to be in turn again abandoned." Plants, therefore, having no decomposition and recomposition of any completed fabric, can not have a function of respiration like that of animals.

the sap and in the air, at the ordinary temperature of the atmosphere. This agency is exercised, 2nd, by the fixation of this carbonic acid in the form of solid carbon, and by the transformation of this inorganic matter into the organized living substance of plants.

150. Carbonic acid gas, which is prejudicial to animal life, is indispensable to the nourishment and growth of plants. Hence, while plants are absorbing their own peculiar nutriment from the atmosphere, they are at the same time purifying it, and fitting it for the support of animal life. This they accomplish both by preventing a constant increase of carbonic acid gas in the atmosphere, arising from the decomposition of vegetable and animal substance, and from combustion, as well as by restoring to the atmosphere oxygen gas, an element indispensable to animal life. Thus by a beautiful arrangement of Providence, the two organic kingdoms of nature materially sustain each other, being so adapted, the one to the other, that each removes from the atmosphere what were noxious to the other, and each yields to it what is essential to the other's continued existence. This is but one of a thousand instances in nature of reciprocal adaptations of means and ends, affording us the clearest proof of wisdom and design.

ORGANS OF REPRODUCTION.

151. The organs of reproduction are those designed for the continuation of the species. Every plant in its natural state posesses some means of reproducing its kind, but these differ very much in the various tribes, from the simple evolution of new cells in the Cryptogamia, to the more complicated apparatus in the Phænogamia. They consist of the FLOWER, and the parts developed from it, namely the Fruit and the Seed.

152. Flowers, like branches, are evolved from buds. Flower-buds are formed in the same situation as leaf-buds, at the apex of the stem or branches, and in the axils of the leaves.

INFLORESCENCE.

153. The term *inflorescence* is used to designate the arrangement of flowers upon the stem or branches.

154. The simplest kind of inflorescence is that of a solitary flower, either terminating the stem, as in the Tulip and Erythronium, or when it arises from the axil of a leaf representing an axillary bud, as in the Brassenia and leafy-stemmed Violet. These two simple cases exhibit the two types, to the one or the other of which all the forms of inflorescence belong.

155. If the flower is supported by a naked stalk, it is called *peduncled*, but when it rests directly in the axil of the leaf, or is not raised on a proper stalk, it is said to be *sessile.*

156. The PEDUNCLE may be either *simple*, or *branched ;*

when it is divided into branches, each of which bears a single flower, these branches are called *pedicels.*

157. A SCAPE is a flower-stalk which springs directly from the root, or a subterranean stem, as in the Dandelion, Sarrecenia, and Hyacinth. Like the peduncle, it is leafless, or with bracts only, and may be either *simple* or *branched.*

158. The RACHIS is that part of the general peduncle along which the flowers are generally borne, sometimes called the *axis* of *inflorescence.*

159. In *centripetal inflorescence,* the blossoming or expansion of the flowers commences with those of the base, and proceeds towards the summit, or from the circumference to the centre, as in the Cruciferæ and Umbelliferæ families. It will be readily understood that the circumference of a flattened or depressed inflorescence corresponds to the *base* of an oblongated one; the *centre* of the former answering to the summit of the latter.

160. In *centrifugal inflorescence,* the blossoming commences with the terminal and central flowers, and proceeds towards the outside, or those of the circumference, as in the Hydrangea and Elder. This mode of inflorescence is generally indicated by the presence of a solitary flower, situated in the axils of the forked branches, as in the Pink tribe.

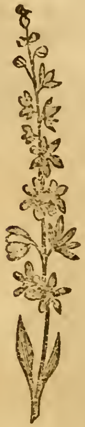
161. "These two modes of inflorescence are sometimes combined in the same plant, the general axis developing in the one way. Thus the heads of all the Compositæ are *centripetal,* the flowers expanding regularly from the margin or circumference to the centre; while the branches that bear the heads are developed in the centrifugal mode, the terminal or central heads first coming into flower. This is exactly reversed in all the Labiatæ (plants of the mint tribe,) where the stem developes in the centripetal mode, and the axillary clusters of the flowers being produced in the form of a general *raceme* or *spike,* which blossoms from below upwards; while the flowers from each cluster form a cyme, and expand in the centrifugal manner."—*Gray.*

162. The following are the principal varieties of centripetal inflorescence—the *spike, raceme, corymb, umbel, head, spadix, ament, panicle,* and *thyrse.*

163. SPIKE (Fig. 75,) is an inflorescence, where the sessile flowers in the axils of the bracts are arranged along an

elongated commom peduncle, as in the Plantain, Vervein, Mullein.

75.



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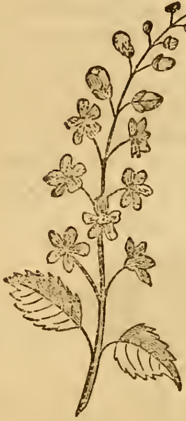
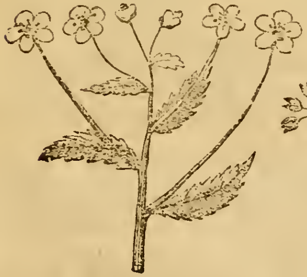


164. The Raceme (Fig. 76,) is the same as the spike, except that the flowers are raised on pedicels; as in the Wild Cherry, Hyacinth, Pyrola.

165. The Corymb (Fig. 77,) is the same as the raceme with the lower pedicels elongated, so as to elevate all the flowers to nearly or quite the same level, as in the Hawthorn, Crab-Apple.

77.



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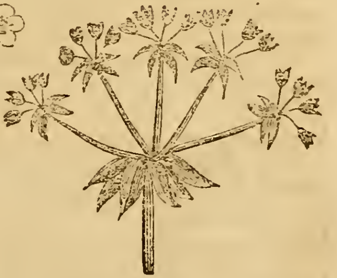


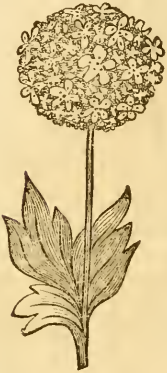
166. The Umbel (Fig. 78,) only differs from a corymb

in having all the pedicels arising from the same point, and are mostly equal in length, as in the Asclepias, Cowslip, Primrose, and the Umbelliferæ generally.

167. A Head (or Capitulum, Fig. 79,) is the same as an umbel with the pedicels all shortened, so as to bring the flowers all into a close rounded head, as in the Clover, Button-bush, Teasel.

The axis or rachis of a head is called the *receptacle*. Frequently, instead of being at all prolongated, it is flat and dilated longitudinally, so as to allow a large number of flowers to stand on its level surface, as in the Sunflower, and the Compositæ (compound flowers) generally.

79.



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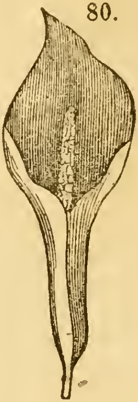


168. The Spadix (Fig. 80,) is merely a fleshy spike, enveloped by a large bract, called *Spathe*, as is seen in the Ethiopean Calla, Indian Turnip (Arum triphyllum.)

169. The Ament or Catkin (Fig. 81,) is merely a particular kind of spike with a scaly bract, crowded together, usually falling off in one piece after flowering, as in the Birch, Poplar, Willow, Alder.

170. The Panicle (Fig. 82,) is a compound inflorescence, formed by the irregular branching of the lower pedicels of the raceme, as in the Oats, Spear grass, and many other Grasses.

171. The Thyrse (Fig. 83,) is the same as the panicle, having the lower branches shorter than those in the middle,

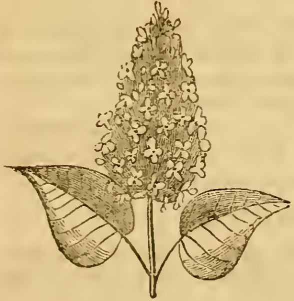
and all of them very compact, as in the Lilac, Horse Chestnut.

81.

82.

172. Of the Centrifugal inflorescence, the following are the principal varieties: the *cyme, fascicle,* and *vertical.*

83.



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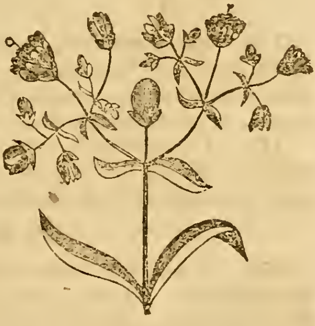


173. The CYME (Fig. 84,) has the general appearance of the Corymb, but is remarkably distinguished by its centrifugal evolution, and by its branches being repeatedly 2 or 3 forked, as in the Hydrangea, Viburnum. This mode of inflorescence is only found in plants with opposite leaves, and is developed in the following manner:

The terminal flower, which expands first, is borne upon a peduncle of two or more nodes; from these nodes, pairs of secondary opposite peduncles arise, each terminated by a flower, each of which, like the first, may again have two or more nodes, and terminated by a flower.

174. The Cyme as exemplified in the Arenaria stricta (Fig. 84,) enables us to study this mode of inflorescence to advantage.

175. The **Fascicle** (Fig. 85,) is a modification of the Cyme, in which the flowers are crowded, and nearly sessile, as is seen in the Sweet William, and Wild Pink, (Dianthus armerius.)

85.

86.

176. The **Vertical**, or *Verticillaster* (Fig. 86,) is a modification of the Cyme, peculiar to Labiate plants, where two such reduced Cymes occupy the opposite axils of each pair of leaves, as in the Horehound, Catnip, Mint.

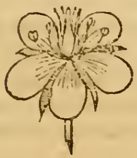
177. Verticillate flowers are sometimes said to be whorled, which is not really the case. True whorled flowers occur only in plants with whorled leaves, as in the Hippurus.

THE FLOWER.

178. A complete flower (Fig. 87,) consists of the following members: 1st, the *floral envelopes*, called, collectively, the PERIANTH. 2nd, the STAMENS. 3rd, the PISTILS; and 4th, the RECEPTACLE, or TORUS.

179. The *floral envelopes* consist of one or more circles or whorls of leaves surrounding the essential organs, namely, the stamens and pistils. The outer envelope is called the *calyx*, and its leaves are termed *sepals*. The inner is called *corolla*, and its leaves *petals*.

87.



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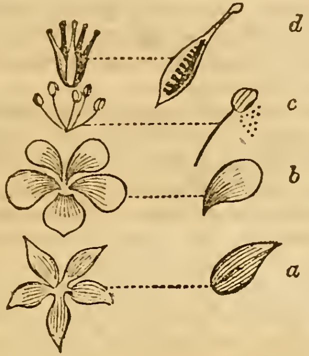


(Fig. 88,) ideal plan of a flower like that shown in (Fig. 87); the different sets of organs separated to some distance from each other, to show the relative situation of the parts; one of each, namely, *a.* a sepal, *b.* a petal, c. a stamen, and *d.* a pistil.

CALYX.

180. The *Calyx* (from the Greek *kalix*, a cup,) consists of a whorl of leaves with their edges distinct, or united, generally green, but sometimes highly colored. When the sepals are united so as to form a more or less perfect tube, it is said to be *monosepalous* or *gamosepalous*. The lower part is called a *tube*. When the sepals are separate and distinct, it is *polysepalous*. When it adheres to the ovary, and invests it, it is said to be *superior*, and when no such combination takes place, it is said to be *inferior*.

181. In respect to duration, it is *caducuous* when it falls off as soon as the flower is expanded; *deciduous*, when it falls off as the flower decays; and *persistent*, when it remains after the corolla has fallen.

182. The calyx is sometimes reduced to a whorl of mere hair-like processes, called *pappus*, or *down*. This kind of calyx is peculiar to the Compositæ (compound flowers.) If the pappus consists of simple hairs, it is said to be *pilose*; if the hairs are feathery, *plumose*; if bristly, *setose*; and if chaffy, *foliacuous*.

COROLLA.

183. The Corolla, (Lat. *corolla*, diminutive of *corona*,

a crown,) the interior envelope of the flower, consists of one or more circles of leaves, either distinct or united, usually of some other color than green, and of a much more delicate structure than the calyx. When the petals are united into a tube, it is said to be *monopetalous* or *gamopetalous;* when not united, *polypetalous.*

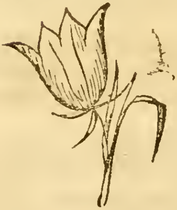
184. A petal consists of two parts; the *claw* and the *lamina* or *limb.* The claw is the narrow part at the base, corresponding with the stalk of a leaf. It is sometimes very long, as in the Pink and Saponaria, and often is wanting, as in the Rose and Poppy. The lamina is the expanded portion, supported by the claw, and corresponds with the blade of a leaf.

185. A monopetalous corolla may be regular or irregular. It is *regular* when all the parts correspond to each other in shape, size, and cohesion. The regular monopetalous corolla assumes various forms, which have received the following names:

1. Companulate (bell-shaped, Fig. 89,) when the tube of the corolla is wide and swelling abrubtly at the base, as in the Canterberry bell, and Harebell.

2. Infundibuliform (funnel-form, Fig. 90,) when tubular at the base, but gradually enlarging towards the border, as in the Morning Glory and Four-o'clock.

89.



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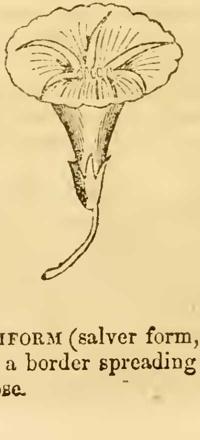

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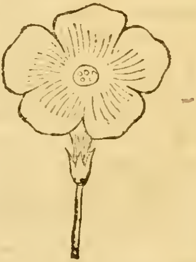


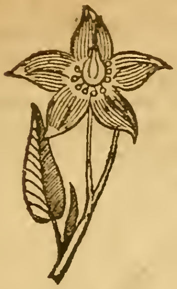
3. Hypercrateriform (salver form, Fig. 91,) when the tube ends abruptly in a border spreading horizontally, as in the Phlox and Primrose.

4. Rotate (wheel-form, Fig. 92,) when the limb is regular, or nearly so, spreading with a very short tube, as in the Mullein and Lysimachia.

186. It is *irregular* when the incisions are not uniform, and the opposite sides are not arranged on the same axis. The irregular corolla is—

1. Labiate (lipped, Fig. 93,) when the limb is deeply cleft into two irregular segments, called the upper and lower lips. When the lips are widely separated, and the throat open, it is called *ringent* or *gaping*, as in the Monkey flower. When there is an appendage between the lips like a palate, so as to hide the interior, it is called *personate* from *persona* a mask, as in the Snap-dragon and Toad-flax. If the upper is arched, it is termed the *galea* or *helmet*, as in the Sage, Lavender, and Catmint. This form of the corolla is characteristic of plants of the Labiatæ, (Mint Family.)

92.



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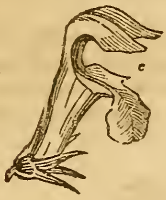

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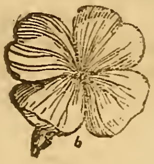


187. A polypetalous corolla also may be regular or irregular. The lower part of the petal is called the *claw*, and when this is well marked, they are said to be *unguiculate*; the upper and spreading portion is termed the *lamina* or *border*.

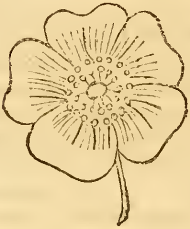
Regular polypetalous corollas have received the following names:

1. Cruciform, (Fig. 94,) when there are four petals spreading at right angles to each other in the form of a cross, as in the Mustard, Radish, Turnip. Plants with this corolla constitute the Natural Order Cruciferæ, corresponding to the class Tetradynamia in the Linnean arrangement.

2. Rosaceous (like the rose, Fig. 95,) when the corolla

is regular, consisting of five or more petals, attached to the receptacle with little or no claws, as in the Rose, Apple, and Cherry.

95.



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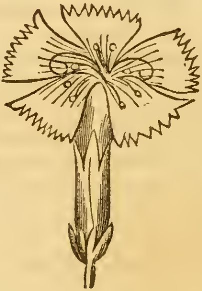
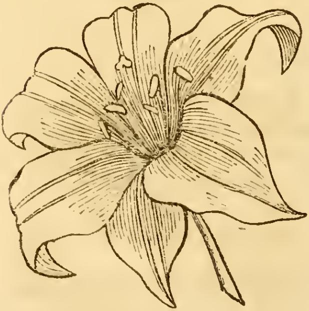


3. Caryophyllaceous, (like the pink, Fig. 96,) when the corolla consists of five petals, having long claws which are inserted into a tubular calyx, as in the Pink, Catchfly, and Rose campion.

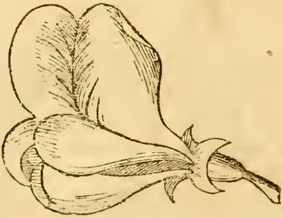
4. Liliaceous, (like the lily, Fig. 97,) when the perianth consists of six parts, each of which curve outwards in the form of a bell, as in the Lily, Tulip, and Erythronium.

188. The *irregular* polypetalous corolla is—

97.



98.



1. Papilionaceous (butterfly-shaped, Fig. 98,) when it consists of five dissimilar petals, the upper end is called the *banner* (vexillum); the two middle and lateral ones beneath the banner, the *wings* (alæ); and two lower ones, also parallel

and cohering by their margins, the *keel* (carina); as in the Locust, Pea, and Bean.

189. Petals are sometimes furnished with appendages on their inner surface, such as the *crown* and the *scale*. The crown is situated generally at the summit of the claws, as in the Silene, Saponaria, and Lychnis. The scale is generally found on monopetalous corollas, as in the Comfrey, Myosotis.

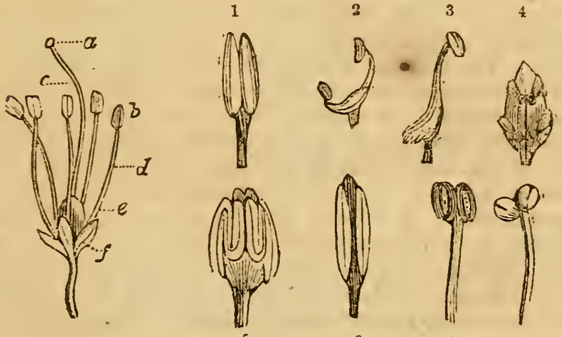
190. "The bodies termed nectaries by the older Botanists, are either petals of unusual form, such as the spur of the Columbine, or petals passing into stamens, such as the fringe of the Passion-flower and of Parnassia, or else abortive and transformed stamens, as in Canna.

The so called nectary of Orchidaceous plants is merely one of the petals, which, being constantly of a different shape from the others, is termed the *labellum* or *lip*."—*Gray*.

STAMENS.

191. The Stamens, (Fig. 99,) are those slender organs, (*b*.) situated next within the floral, envelopes and around the pistils (*c*.). They vary in number from one to fifty, or one hundred. Their office is the fertilization of the seed. They are collectively called the Andræcium (from *andres* the plural of *aner* a man, *stamen*, and *oikos* a house). They consist of two parts, the *filament* and *anther*.

99.



Stamens, pistils, &c.,—*a*, stigma; *b*, anthers; *c*, style; *d*, filament; *e*, ovary; *f*, calyx and receptacle. Form of anthers—1, Lily; 2, Ginger; 3, Sage; 4, Berberry; 5, Cucumber; 6, Magnolia; 7, Polygonum; 8, Lemna.

192. The **Filament**, (Lat. *filum*, a thread, Fig. 99, *d.*,) is a long slender body which supports the anther, containing numerous spiral vessels. It is called *prominent* when it projects beyond the anther, *petaloid* when it is broad and thin; when it is wanting the anther is said to be *sessile.*

193. The **Anther**, (Fig. 99, *b.*) is generally situated at the summit of the filament; it is the essential part of the stamen, and contains the pollen. It usually consists of two *lobes* or *cells*, connected to each other and to the filament by the *connectile.*

It is attached to the filament in three principal ways; and is said to be—*Adnate*, when attached by its back, so as to appear lateral, as in the Nymphæa, and Anemone. *Innate*, when it is attached by its base, as in the Menispermum. *Versatile*, when it is attached by a single point, from which they hang loosely, as in the White Lily, and most of the Grasses.

When the filament is on the outside of the anther, so that the latter faces the pistil, it is called *introrse*, as in the Violet; when, on the contrary, the filament is attached to the inside of the anther so that it faces the pistils, it is said to be *extrorse*, as in the Larkspur.

194. The cells of the anthers usually open by a longitudinal fissure, called the *dehiscence*; but they also open by other modes. Some open by an aperture in the summit, as in the Potato, and Heath family; others open by valves, as in the Berberry, when the whole side of the cell is detached and turns back, as on a hinge.

195. The **Pollen** is a very fine powder, contained in the cells of the anthers, usually of a yellowish color. It consists of small vescicles, of various forms, usually spherical, but occasionally cylindrical, and sometimes polygonal, always being of the same form in the same species. The pollen grains are generally distinct from each other, but are sometimes connected by cellular threads, as in the Œnothera; coherent in small masses, as in the Mimosa; and are sometimes collected into one or more groups, called *pollinia*, as in the Orchidaceæ. When ripe, the pollen grains burst, and the inner membrane protrudes, constituting a channel for the transmission of a mucous fluid called the *fovilla*, to the ovule.

196. The **Fovilla** consists of minute particles of mole-

cules of a spherical or oblong form, suspended in a fluid possessed of tremulous motion.

197. The DISK is a ring, either entire or lobed, or a row of fleshy bodies, situated between the bases of the stamens and pistils. It is said to be *hypogynous,* when it surrounds the base of the ovary, as in the Peony; when it adheres to and lines the tube of the calyx, *perigynous,* as in Rosaceous plants; and when it appears at the top of the ovary, where the calyx is superior, it is *epigynous,* as in the Cornus, Aralia; in this case, when confluent with the base of the style, it is called the *stylopodium.*

PISTIL.

198. The PISTILS (Fig. 100, *c.*) occupy the centre of the flower, sometimes numerous, but often only one; collectively, they are called GYNACEUM, (*guna,* a woman, pistil, and *oikos,* a house).

A pistil is composed of three parts—the *stigma,* the *style,* and the *ovary.*

100. 101. 102. 103.

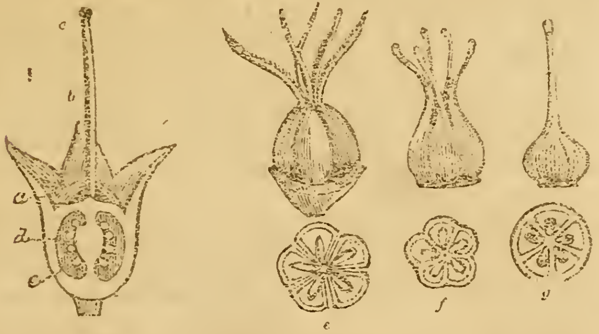


Fig. 100. Pistil of a Whortleberry; *c*, the stigma; *b*, the style; *a*, the epigynous disk; *e*, perpendicular section of the ovary, combined with the adherent (superior) calyx; *d*, the placentæ with the ovules. Fig. 101, the gynæcium of a flower with 5 pistils showing the carpels and styles distinct; *e*, cross section of the same; Fig. 102, the carpels united and the styles distinct; *f*, cross section of the same; Fig. 103, both carpels and styles united; *g*, cross section of the same.

199. The STIGMA (Fig. 100, *c.*), is the upper portion, or extremity of the style, usually globular, but varies considerable in different species. It is of a glandular nature, usually covered with a viscid fluid, and is destitude of a cuticle; being

an essential organ in reproduction, and it exercises a peculiar action on the fecundatory pollen. It is called *sessile* when the style is wanting, in which case it rests immediately on the ovary.

200. The STYLE (Fig. 100, *b.*) is the long cylindrical column arising from the ovary, and is terminated by the stigma. The number of styles, always equals the number of the carpels, but where the carpels are closely united, the styles may be united, also, into a single compound column.

The number of distinct styles (or of stigmas, where the style is absent) constitutes the basis of the Linnæan artificial orders, into which the first thirteen classes are divided.—[See Classification.]

201. The OVARY (Lat. *ovarium*, a depository, Fig. 100, *c.*) is the hollow portion of the pistil, situated at its base, containing the *ovules*, or young seeds, within its cavities.

202. The ovary is either *simple* or *compound*. When simple, it consists of a single sac or cell called the CARPEL. (*karpos*, fruit). When compound, it consists of two or more such carpels, united together more or less closely. Sometimes the division (*dissepiments*) formed by their contiguous sides are very evident, (Fig. 101,) being but slightly connected, while in other cases all external marks of them disappear. (Fig. 103.)

203. In a whorl of simple ovaries, the line which represents the united margins of the carpels is on the inner side, or next the axis. This line is called the inner or *ventral suture* (seam). A similar line down the back or out side, is called the *dorsal suture*.

204. The line or ridge formed by the union of the margin of the carpels, to which the ovules are attached, often projecting more or less into the cavity of the ovary, is called the *placentæ*. Each placentæ necessarily consists of two parts, one belonging to each of the confluent margins of the carpels.

205. The placentæ is *central*, when the carpels are developed around a central axis; and *parietal*, when the dessepiments are contracted so as to bring the ovules near or on the walls of the compound ovary.

206. When the bases of the stamens are inserted into the top of the receptacle, and the ovary forms no adhesion to the sides of the calyx, it is said to be *superior*, and the stamens and calyx are *inferior* or *hypogynous*; but when the ovary

adheres to the side of the calyx, and the stamens and corolla are inserted into it or into a disk above the ovary, it is said to be *inferior*, and the stamens and corolla *superior* or *epigynous*.

207. The OVULES (Fig. 100, *d*.), are the rudiments of the future seed; they are of a globular form, attached to the placentæ, either immediately, or by a short stalk; they vary in number. When there is one, it is said to be *solitary;* where their number is uniform and not numerous, *definite;* and where they are very numerous, *indefinite*. They also vary as to situation and direction, with respect to the cavity on which they are contained; they are said to be *ascending*, when fixed to the placentæ above the base and directed upwards; *horizontal*, when they project from the side of the cell; *pendulous*, when their direction is downwards, and *suspended*, when they are affixed to the top of the ovary, and hang perpendicularly.

208. The ovules are almost always enclosed in the ovary. In the Mignionette, they are partially naked, and in the Coniferæ (Pine family) they are entirely so, the carpels being open or wanting, as is seen in the cones of the pines.

209. The ovule consists of a *nucleus* enclosed within two sacs called the *primine* and *secundine*. Each of these sacs have open mouths; that of the primine is termed *exostome*, and that of the secundine, *endostome;* they are at first large and separate, but contract as the ovule becomes a seed, and are brought into contact; when the small aperture, or a scar indicating its position is still perceptible, it is called the *foramen* or *micropyle*. The coats of the ovules are distinct and unconnected, except at the base or point of attachment, to the *funiculus* (the stalk by which the ovary is attached to the placentæ,) where they are all perfectly confluent. This point of union is called the *chalaza*. Through the funiculus and chalaza, the ovule derives its nourishment from the placentæ.

FERTILIZATION.

210. In flowering plants, fertilization or fecundation takes place by the action of the pollen of the anthers on the pistils. This appears to be affected in the following manner: when the anthers discharge the pollen contained in their cavities, through their dehiscence, into the air, the pollen grains come in contact with the stigma of the pistil, adhere

to it by the glutinous secretion it exudes, and in a short time affects a remarkable change; the outer coat of the pollen-cell opening and allowing the inner coat to protrude in the form of a tube of extreme tenuity, filled with the fovilla; this passes between the cells of the stigma, and the loose texture of the style, until it reaches the ovary; in the meantime, a cavity, or sac, called the *sac of the amnios*, filled with fluid, makes its appearance in the nucleus of the ovule; and the foramen being brought into contact with the placentæ, or in orthotropous ovules carried up to the summit of the cell, a pollen-tube enters the orifice, and the granules thus reach the nucleus. What further takes place is not known, but it is known that in a short time the embryo appears in the amniotic sac.

RECEPTACLE.

211. The RECEPTACLE or TORUS is the summit of the flower-stalk, out of which the floral organs grow, or on which they are inserted, (in botanical language,) upon which they stand arranged in concentric whorls; the calyx at its very base, the petals just within or above the calyx; the stamens (andrœcium) next within the petals, and the pistils (gynæcium) within or above the stamens, occupying the centre.

212. The receptacle varies considerably in different plants. In the Nelumbo it is dilated into a large, top-shaped body nearly enclosing the pistils in separate cavities. In the Rose, it forms a lining to the urn-shaped tube of the calyx, and bears the numerous pistils on its concave surface. Sometimes the receptacle which elevates the ovary is prolonged more or less above them, and coheres with their styles, as in the Geranium and many allied plants. Sometimes two internodes are conspicuously developed, one between the petals and the stamens, the other between the latter and the pistils; so that the stamens appear to grow out of a long stalk which supports the ovary, as in the Spiderwort (Gynandropsis.)

SYMMETRY OF THE FLORAL ORGANS.

213. A perfect symmetrical flower is composed of four sets of organs, arranged in concentric whorls. The number of sepals, petals, stamens, and pistils being the same, or multiplies of the same, throughout, and the size and form of the members of each set being likewise uniform; so that, if the

sepals be 5, there should be 5 petals, 5 or 10 stamens, and as many pistils. The Flax and Crassula, afford good examples of a perfectly symmetrical flower. In this case, we have a calyx of 5 sepals, a corolla of 5 petals, an andræcium of 5 stamens, and a gynæcium of 5 pistils, and all the parts are regular and symmetrical, and in the former, also, distinct and free from each other.

214. But this plan is very much disguised and complicacated in different plants. The principal causes which probably interfere with and more or less disguise the typical plan of the flowers are—

1. The production of one or more additional whorls or sets of some of the floral organs.
2. The union of the parts of the same set by the cohesion of the contiguous margins.
3. The cohesion of the adjacent parts of different sets.
4. The non-production (suppression) of some of the sets altogether.
5. The non-production or abortion of some of the parts of one or more sets of organs.
6. The unequal developement, or unequal union, of different parts.
7. The deviations or changes in the form of the receptacle or axis of the flower.

215. Several of these deviations from the typical state of the flower, do not interfere with its symmetry, a flower being termed *symmetrical*, when there are an equal number of parts in each series.—*Gray*.

216. In the *typical* or *normal* symmetrical plan, the organs of each set successively alternate with each other, that is, the sepals alternate with the petals, the petals with the stamens, and the stamens with the pistils. This regular alternation is taken for granted in botanical descriptions, unless otherwise expressed. When any exceptions to this plan occur, they almost universally run uniformly through the family; as in Rhamnaceæ, where the stamens stand opposite the petals, and in Primulaceæ, where they are opposite the lobes of the corolla.

217. The number of component parts of the whole flower, or of any set, is designated by the terms *binary* (in twos); *trinary* (in threes), as in most Endogenous plants; *quaternary* (in fours ; *quinary* (in fives), the most prevalent mode in plants of the Exogenous structure. Sometimes they are designated by the following: *bimerous* in 2, *trimerous* in 3, *tetramerous* in 4, *pentamerous* in 5, and *hexamerous* in 6.

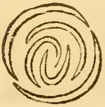
ÆSTIVATION.

218. Aestivation (*æstivus*, the summer state,) is the term used to denote the manner in which the several parts of the flower, especially the calyx and corolla, are arranged and envelope each other, while yet in the bud. By some authors, it is also called *perfloration.* The plan of perfloration is best seen in a transverse section of a flower bud, made by cutting it in a horizontal direction.

219. There are two principal plans of æstivation, the *imbricated*, or spiral, and the *valvate.*

220. The IMBRICATED is by far the most common, and its varieties have received the following names:

104.



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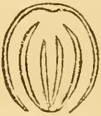

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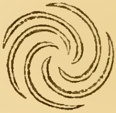

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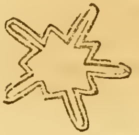

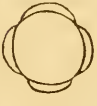

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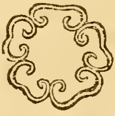

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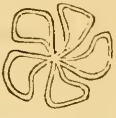

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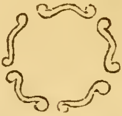


111.

1. **QUINCUNICAL** (Fig. 104,) when the petals or sepals are five in number, two of which are exterior, two interior, and the remaining fifth enveloping one of the inner by one margin, and has its other margin covered by the exterior, as in the Rose.

2. **VEXILLARY** (Fig. 105) when one part, called the vexillum, is wrapped around the other petals, they being arranged face to face, as in the Papilionaceous flowers.

3. **CONVOLUTE**, also called *contorted* or *twisted*, (Fig. 106.) where each piece is as it were slightly twisted on its axis, so as to have one margin interior and the other exterior, successively overlapping each other, as in the petals of the Wall-flower, the lobes of the corolla of the Phlox, and the petals of Hypericum.

4. **PLICATE** or *plaited*, (Fig. 107,) where a monopetalous corolla is thrown into plaits and folds, as in the Stramonia, and the Campanula. In the *supervolute*, the plaits are twisted, as in the Morning Glory.

221. In the VALVULAR mode of æstivation, the sepals and petals are disposed in a true circle, and their edges are consequently brought into contact in the bud without overlapping; its several varieties have received the following names:

1. VALVATE (Fig. 108,) as in the Mallow tribe and Umbelliferæ.
2. INDUPLICATE (Fig. 109,) this is a modification of the valvate, when the margins are bent abruptly inwards, and the external face of these applied without any twisting, as in the sepals of Clematis.
3. INVOLUTE (Fig. 110,) when the margins are rolled inwards until they meet, as in the petals of Lysamachia.
4. REDUPLICATE (Fig. 111,) when the edges are turned outwards instead of inwards, as in the Potato.

222. The æstivation of the two sets of floral envelopes, frequently varies in the same plant. Thus in Malvaceæ, the æstivation of the calyx is valvate, that of the corolla contorted. In the Morning Glory and the Wallflower, the calyx is imbricated, the corolla contorted. In the Cistaceæ, the calyx and corolla are both twisted, but in opposite directions.

THE FRUIT.

223. The fruit is composed of the ovary and its contents, arrived at maturity, and is the provision made by nature for the reproduction of the species, so that it may be justly styled "the termination of the old plant, and the beginning of the new." The fruit is therefore the most important part of the plant, its perfection being the ultimate object and aim of the whole vegetable organization. Although it does not possess the beauty of form and various tints of color of the flower; yet, besides its peculiar office of perpetuating vegetable life, it affords one of the principal means of subsistence to the animal kingdom.

224. Sometimes it is dry and membranaceous, crustaceous, and even woody, or else gradually changing to fleshy, pulpy, or juicy masses, but these are sometimes made up of the other organs, such as an adherent calyx, which, in the Apple and Pear, becoming greatly thickened and fleshy, forms the principal bulk of the fruit. Sometimes the mass is made up of other organs, as in the Strawberry, in which the pulp is an enveloped and fleshy receptacle, bearing the numerous seeds upon its surface. The Pine-apple is composed of a whole head or spike of flowers, with their bracts and receptacle all consolidated into a solid mass. The Fig bears its seed in a very singular manner, enclosed in a fleshy receptacle which is hollow and nearly closed at the top, resembling a curved cone in form.

225. The fruit consists of two parts, the covering called the *pericarp* (*peri* around, *karpos* fruit,) or *seed vessel*, and the *seeds*.

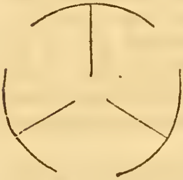
PERICARP.

226. The pericarp consists of three different parts, the *epicarp,* the outer integument or skin; the *endocarp,* or shell, and the *sarcocarp,* the intermediate fleshy or pulpy mass. Thus, in the Peach, Plumb, and Cherry, the outer skin is the *epicarp,* the hard shell which contains the seed is the *endocarp,* and the pulpy, fleshy mass between the two, the *sarcocarp.*

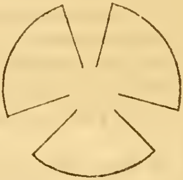
227. The fruit, when mature, often remains closed, as in the Acorn, Apple, Grape, &c., when it is said to be *indehiscent.* In other cases it seperates wholly or partially into several pieces, and discharges the seed, when it is said to be *dehiscent.*

228. Regular *dehiscence* always takes place in a vertical direction, by the opening of one or both sutures, or by the disunion of confluent parts. The pieces into which a distinct pericarp separates, are called its valves. The several varieties of dehiscence have received the following names:

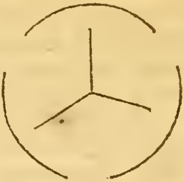
112.



113.



114.



1. Loculicidal (Fig. 112,) when the pericarp bursts vertically, the dorsal suture opening directly into the cell, the parietal placentæ in this case being borne directly in the middle of each valve, as in the Lily and Rockrose (Helianthamum).

2. Septicidal (Fig. 113,) when the pericarp opens longitudinally through the dissepiments, the placentæ occupying the margins of the valves, as in the Mallows.

3. Septifragal (Fig. 114,) when the dissepiments remain coherent to the axis, and separate from the valves, as in the Morning Glory.

4. The pericarp may also open at one or both sutures of a single carpel, when it is called *sutural,* as in the Pea; or it may be porous at the apex, as in the Chickweed, Tobacco, and Primrose; and occasionally by mere points or pores, as in the Poppy.

229. An *irregular dehiscence,* called *circumscissile,* occurs in such fruits where the pericarp divides transversely, so that the upper part falls off like a *lid,* as in the Verbena, Plantain, and Purslane.

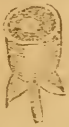
230. The pericarp is of various forms, which have been

studied by Botanists with great attention, and minutely classified. The principal varieties are the following:

1. CAPSULE (Casket, Figs. 115, 116, 117,) is a general term for all dry and dehiscent fruits resulting from a compound ovary, opening at the sides, or top, by *valves*, as in the Hypericum, or bursting irregularly, as in Lobelia, or shedding the seeds through chinks or pores, as in the Poppy.

It may be 1-celled, as in the Hippuris (Fig. 115); 2-celled, as in the Tobacco (Fig. 116); 4-celled, as in the Polomonium and Phlox; 3-celled, as in the Epilobium; 5-celled, as in the Flax; and 6-celled, as in the Wild Ginger, (Asarum Canadense).

115.



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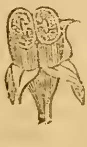

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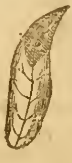


2. A FOLICLE (Fig. 117,) is a fruit formed of a single carpel, with one valve and one cell, opening by a sutural dehiscence on the inner side, and leaving the seeds at the base or along the suture, as in the Larkspur, Columbine, and Peony.

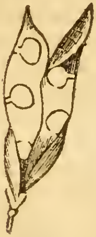
3. LEGUME or POD (Fig. 118.) is a fruit formed of a single carpel and dehiscent by both the dorsal and ventral suture, so as to separate into two valves, having its seeds attached to the margin of each valve alternately, as in the Pea, Locust, and Plants of the Natural Order Leguminosæ, generally.

4. LOMENT or LOMENTACEOUS LEGUME, where the legume is divided into two or more one-sided joints, and falling to pieces at maturity, as in the Desmodium.

5. SILIQUE (pod, Fig. 119,) is a long, narrow pericarp of two valves, divided into two cells by a false dissepiment, formed by the extended placentæ, to the edges of which the seeds are attached, alternately, with its opposite sides, as in the Mustard, Wallflower, and Cabbage. This constitutes the 2nd Order, called *Siliquosa*, of the Linnaen class Tetradynamia.

6. Silicle (a little pod,) differs from the Silique in being shorter, and nearly oval, as in the Pepper Grass, and Shepherd's purse (Capsella). On this distinction is founded the first order *Siliculosa*, of the Linnaen class Tetradynamia.

118.



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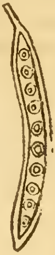
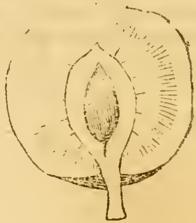


120.



7. A Drupe or stone fruit (Fig. 120,) is a one-celled, one or two-seeded simple fruit, indehiscent, with a hard and long *endocarp*, covered with the fleshy *sarcocarp*, which is also covered with the *epicarp*, as in the Peach, Plum, and Cherry. This name, though strictly applicable only to fruits of this kind, is extended to all fruits of similar texture resulting from a compound ovary, as in the Walnut, and even to those of several bony cells enclosed in pulp, as in the Buck-thorn; the latter, however, are generally called drupaceous.

8. A Nut is a hard, indehiscent fruit, produced from an ovary of two or more cells, with one or more ovules in each, all but a single ovule and cell having disappeared during its growth. It differs from the drupe in being seated in a kind of persistent involucre called a cupule, as in the Chestnut, Oak, Hazle, and Beach.

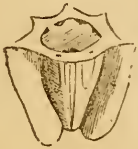
9. An Achenium (Fig. 121,) is a small, dry, indehiscent, one-seeded pericarp, as in the Ranunculus. It is sometimes terminated by a plumose and persistent style, in the form of a feathery tail, as in the Anemone and Clematis. In the Rose, the achenium are seated on the hollow expansion of the receptacle, while in the Strawberry they are seated on the surface of the pulpy receptacle. In the Blackberry and Raspberry, the achenium are changed to little drupes. The name achenium is also applied to all similar one-seeded fruits resulting from a one-celled ovary, formed of more than one

carpel, and invested by the calyx-tube, as in the Compositæ or Syngenesious plants.

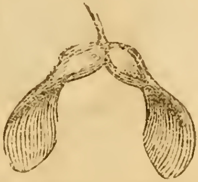
10. A CREMOCARP (Fig. 122,) consists of a pair of achenia placed face to face, and invested by the calyx-tube, which when ripe separate from each other, or from a central axis, called the *carpophore*, as in the Umbelliferæ to which the name is restricted. Each separate or half fruit, or carpel is called a *hemicarp* or *mericarp*, and its inner face the *commissure.*

121.

122.



123.



11. A CARYOPSIS is a thin, membranaceous, one-celled pericarp, inseparable from the seed which it encloses, as in Wheat, Indian Corn, and most Grasses.

12. A UTRICLE is a caryopsis which does not adhere to the seed, as in the Chenopodium.

13. A SAMARA (Fig. 123,) is a nut or achenium with a winged apex or margin, as in the Birch, Elm, and Maple.

14. A PYXIDIUM or Pyxis (box), is a capsule which dehisces transversely, so as to appear like a little cup with a lid, as in the Plantain, Purslane, and Bartonia.

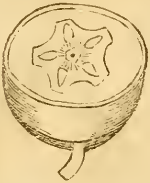
15. A BERRY is an indehiscent, fleshy or pulpy fruit, containing the seeds loosely within, as in the Grape, Gooseberry, and Currant. A *Thesperidium* or Orange is merely a berry with a leathery rind.

16. A POME (Apple, Fig. 124,) is a fruit composed of two or more cartaleginous or long carpels, which enclose the seeds more or less enveloped in the pulpy expansion of the receptacle or disk, and the whole invested by the succulent tube of the calyx, as in the Apple, Pear, and Quince.

17. A PEPO (gourd,) is an indehiscent, fleshy, or internally pulpy fruit, usually composed of three carpels, invested by the calyx, and a firm rind, as in the Cucumber, Melon, and Gourd.

18. A STROBILE or CONE (Fig. 125,) is an aggregated fruit, consisting of scale-like carpels spread open, each bearing one or more naked seeds, as in the Fir tribe (Coniferæ). The cones of the Tulip, Poplar (Liriodendron,) are, however, entirely different, consisting of numerous aggregated carpels of a single flower, attenuated at the apex into a scale, crowded on the elongated receptacle.

124.



125.

231. ANTHO-CARPOUS fruits, are those *multiplex* or collective fruits which result from the combination of several flowers into an aggregated body or mass, as in the Pine Apple and Mulberry. The Fig results from a multitude of flowers concealed in a hollow receptacle or flower-stalk, which becomes pulpy and edible. Thus the fruit seems to grow directly from the branch without being preceded by a flower. In the Mitchella, and some species of Lonicera, the ovaries of two flowers are uniformly united, so as to form a double berry.

SEED.

232. The seed is the matured ovule, containing the rudiments of a new plant, similar in every respect to the original. It consists of a nucleus usually enclosed within two integuments.

233. The INTEGUMENTS or external coverings, consist of several membranes, to which appropriate names have been applied. The first or outer membrane is called the *testa,* or episperm. It varies greatly in texture; sometimes it is membranaceous (papery,) coriaceous (leathery,) bony, fleshy, or woody. Its surface is generally smooth, sometimes beautifully polished, as in the Indian Shot (Canna) or Columbine, and often highly colored, as in varieties of the Bean, &c. It is

sometimes expanded into wings, as in the Catalpa and Trumpet flower, which renders the seeds buoyant, and facilitates their dispersion by the wind. The *testa* is sometimes provided with a tuft of hairs at one end called the *coma*, as in the Epilobium, Asclepias, and Apocynum. In the seeds of the Cotton plant the whole testa is covered with wool.

The inner integument, corresponding to or resulting from the secundine of the ovule, is called the *tegmen*. Although often very obvious, it is sometimes undistinguishable, or entirely wanting.

234. Seeds are sometimes furnished with a complete or partial covering, exterior to the proper integuments, arising from an expansion of the apex to the seed-stalk or FUNICULUS, (or from the placentæ itself when the funiculus is wanting), called the aril. It forms a complete pulpy envelope in Euonymus and Celastrus, or a mere scale on the one side of the seed in Fumaria, and a tough gashed covering called *mace* in the Nutmeg.

235. The *hilum* or *scar* is that point or mark left on the coats of the seed, by its separation from the funiculus. It is commonly called the eye, as is seen in the Pea, Bean, &c.

236. The NUCLEUS, or *kernel*, consists of the albumen (when it is present in the seed,) and the *embryo*.

237. The ALBUMEN consists chiefly of starch. It constitutes the chief bulk of some seeds, as Corn, Wheat, Rye, &c., and serves to nourish the embryo in its latent state. It is *farinaceous* or *mealy* in all the grasses, especially in the grains used for food. *Corneceous*, or bony, in Leontice, Coffee, &c.; oily in the Poppy and Flax; and fleshy in the greater number of seeds. The albumen not being an essential part is sometimes entirely wanting, as in the Pea, Bean, &c.

238. The EMBRYO is the initial plant or new individual, and is the most important part of the seed; to its growth and protection all the other parts are made subservient.

239. The embryo possesses in a rudimentary or undeveloped state, all the essential organs of vegetation, such as root, stem, and leaves. In some seeds these several parts are distinctly visible, as in the Linden, Bean, and Convolvulus. The embryo is divided into three parts, the *Radicle, Plumule,* and *Cotyledons.*

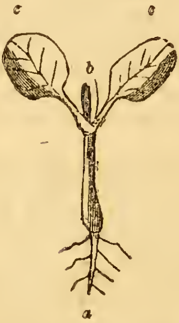
240. The RADICLE (Fig. 126, *a.*) is the lower part, or descending portion, destined to form the root.

241. The Plumule (Fig. 126, *b.*) is the terminal bud, or ascending part of the embryo.

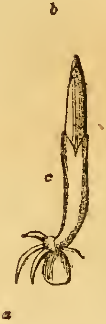
242. The Cotyledons (Fig. 126, *c.*) are the two lobes, or rudiments of the first pair of leaves, usually called seed leaves. They are very conspicuous in some plants, such as the Bean, Squash, Cucumber, &c.

243. The number of cotyledons is variable; and in this difference is founded one of the most important distinctions of the first Grand Division of the Vegetable Kingdom called Phænagamia or Flowering Plants.

126.



127.



244. Dicotyledons (Fig. 126,) are those plants which bear seeds with two or more Cotyledons. They are also called Exogens, (outside growers,) because the stem increases by external accretions, and bears reticulate-veined leaves.

245. Dicotyledonous Plants constitute the first class of the Natural System, which embraces all the forest trees, and a greater part of the herbaceous plants of the Northern United States.

246. Monocotyledons (Fig. 127,) are those plants whose seeds have but one cotyledon. They are likewise called Endogens (inside growers,) because their stems increase by internal accretions; and bear parallel-veined leaves, as the Lily, Indian Corn, Palms and Grasses. Monocotyledonous Plants compose the second class of the Natural System.

247. In some very rare cases the embryo is destitute of cotyledons; such plants are called *acotyledonous*, as in the Cuscuta.

GERMINATION.

248. Germination is the developement of the embryo from the seed, and its establishment as an independent individual plant.

249. The conditions requisite to germination are heat, moisture, darkness, and a free communication with the air. *Heat* is an essential agent in all vital action, whether it be in the *sprouting* of a seed, or the hatching of an egg. The degree of heat necessary to excite the latent vitality is nearly uniform in the same species, but widely different in different plants, while some seeds germinate at a very low temperature, such as the common Chickweed, the seeds of many tropical plants require a heat of 90 to 100 degrees, and those of temperate climates from 50 to 80 degrees Fahrenheit.

250. *Darkness* is favorable to germination, from the circumstance that during its process a destruction of a portion of organized matter takes place, and carbonic acid is evolved. The reason why light on the contrary impedes germination, becomes evident when we remember that it incites the decomposition of carbonic acid, and the fixation of carbon by the plant; which would, therefore, tend to increase the quantity of carbon rather than to diminish it.

251. *Air* is necessary in germination, because the oxygen contained in it, together with the water absorbed from the soil, produce a chemical change in the starch contained in the albumen, or cotyledons, dissolving it, a portion of which is decomposed and converted into carbonic acid and water with the evolution of heat, while the remainder is generally brought into the more soluble form of dextrine sugar, &c., for the nourishment of the young plant.

252. When seeds are planted at too great a depth they remain torpid, from not receiving the stimulus of air; and when they have not a proper covering of earth, they do not germinate, from not obtaining an equal and sufficient degree of moisture.

253. *Water* is also necessary to soften the different parts of the seed, bring them into a fit state to be absorbed by the embryo, and convey in solution nutritive particles from other sources. It also by its decomposition affords two of the most important ingredients of vegetable bodies. The water which is slowly absorbed swells the cotyledons, the inclosing embryo bursts its envelopes, the radicle protrudes, and taking a

downward direction, fixes itself in the soil; while the budding end elongates in the opposite direction to elevate the plumule above the surface, when the leaves expand in the air and light. Its establishment as an independent individual plant, completes the cycle of vegetable life, and brings us round to the point where we commenced its account.

LONGEVITY OF SEEDS.

254. Seeds retain their vitality for periods ranging much in different species of plants, if placed in circumstances which will neither cause them to germinate nor decay, such as a moderate temperature, with the absence of moisture. While some seeds lose their vitality in a few months, others retain it for centuries. Thus the seeds of Corn have been known to grow when thirty years old, Rye forty, Kidney-Beans one hundred, and grains of Wheat taken from ancient mummies under circumstances of their high antiquity have been made to germinate; but in such cases there is a possibility of being deceived. The following remarkable case, related by Dr. Lindley, leaves but little room to doubt. "I have before me," says he "three plants of Raspberries raised in the garden of the Horticultural Society, from seeds taken from the stomach of a man whose skeleton was found thirty feet below the surface of the earth, at the bottom of a barrow which was opened near Dorchester. He had been buried with some coins of the Emperor Hadrian; *and it is therefore probable that the seeds were sixteen or seventeen hundred years old.*"

DISSEMINATION OF SEEDS.

255. The dissemmination of seeds is a subject highly interesting to the student of nature, and at the same time illustrates the wisdom and design of the great Author of Nature. The air, winds, rivers, seas, and animals all assist more or less in the dispersion of seeds.

Many seeds of grass and grains are provided with a stiff hairy-like awn or beard. This is so much affected by moisture that it lengthens in damp and shortens again in dry weather. The under side is thickly set with short prickles inclining towards the point of the long beard, like the teeth of a saw. When the seed is ripe it drops from the ear and lies thickly strewed upon the ground around the bottom of the stem. Were they all to take root in this situation they would choke each other, and very few if any could come to perfection. The first damp that falls, however, lengthens the awn, the next morning sun shortens it only in one direction, and by this expanding and drying, its place is changed, and soon the seed is dragged away from the foot of its parent stalk.

256. Seeds are also furnished with *wings*, as in the Maple, *pappus*, as in the Thistle, and *coma*, as in the Epilobium, by means of which they are wafted by winds to great distances across rivers, mountains, and even the ocean itself. Others are provided with hooks, by which they lay hold of men and animals, and are thus scattered far and wide. Some seeds are thrown to considerable distances by the bursting of the elastic pericarp, as in the Impatiens and Oxalis.

257. Some seeds have been known to perform long voyages without injury. Thus the seeds of the Mahogany tree, a native of the southern shores, have been found on the coasts of Norway. The Cocoa nut when it falls into the water does not sink, but is floated to some distant shore, germinates, and becomes a lofty tree. A remarkable provision for the dissemination of its seeds is found in the Rose of Jericho, (Anastatica hierochuntina,) of Arabia and Palestine. It is generally found growing on sandy wastes, about three or four inches high, with very small white flowers. When the flowers decay they are succeeded by a little pod, divided into two cells each containing one or two seeds. When the seeds are ripe the leaves fall off, the branches curl up, and all unite together forming a rounded ball, about the size of a man's fist, which is torn from the earth and rolled by winds over the sandy plains, until it reaches some moist spot, where it opens and parts with its seeds.

258. The most remarkable case is found in the Mangrove tree, (Rhizophora Mangle) which inhabits the deep muddy shore of the vast rivers and seas of tropical regions, and is even occasionally met with on the coasts of Florida and Louisiana. Created thus to stand on a surface of mud in order to prevent its sinking, or the winds from overthrowing it in an instant. The base of its stem is divided into a number of arching branches, or ærial roots, which spread out in all directions and dive into the mud at a considerable distance from the tree so as to secure it in its place, like the moorings or fastenings of a ship. Above this arch of ærial roots, the trunk of the tree rises to the height of fifteen feet or more.

But how is the seed of the Mangrove to reach the solid bottom of the swamp, that other trees may be produced? If it falls only on the surface of the mud, it will be floated away by the current and borne to the ocean. If not swept away it will rot on the stagnant surface of the mud. But means have been provided to prevent both these evils. The embryo begins to germinate while the pod is yet attached to the parent branch; the radicle or root end of the embryo elongates into a club-like mass of wood about fourteen inches long, pointed at the end and almost as heavy as iron. This continues to grow suspended from the lower side of the branch until the stalk of the seed vessel can no longer bear its weight; then by a singular contrivance the stalk separates from the branch without injury to the embryo. The club thus loosened with its point downwards, and the embryo at the top, falls with the swiftness of an arrow; it pierces through the mud until it reaches the solid bottom. Here it becomes fixed and the new plant in due time rises above the surface of the mud to establish itself by degrees like its parent tree.

CRYPTOGAMOUS OR FLOWERLESS PLANTS.

259. Having traced the physiological structure of the Phænogamia or Flowering Plants through the successive stages from their first developement from the seed, until we have arrived at that point in the cycle of vegetable existence where we commenced, and having assumed them as the exponents of

the general plan of vegetables, we shall now briefly consider the series of simplifications of the plan assumed, which occur in the Cryptogamia. In framing our brief account in accordance with this view, we shall commence with the highest grade, and trace the progress of simplification downwards. The lower orders of Flowering Plants exhibit the greatest simplification compatible with the existence of proper flowers, as we approach the confines of the Phænogamia. In the Coniferæ and Cycadaceous plants the staminate flowers are often reduced to a single anther, and the pistilate are uniformly reduced to one or more ovules, borne on an open carpellary leaf, which answers to the pistils, and therefore receiving the influence of the pollen in the most direct manner. These are accordingly placed at the very close of the Exogens.

260. The next step in the descending series, brings us to an order of plants of comparatively recent discovery, which in all probability forms the connecting link between the Flowering and Flowerless plants, containing a part of the characteristics of each. They possess a cellular structure, developing flowers immediately from the root while the ovary is filled with *spores* instead of seeds, hence they are called Sporogens or Rhizanths. The Rafflesia Arnoldii is an example.

261. The Cryptogamia are divided into three great Classes, called *Acrogens*, *Anophytes* and *Thallophytes*.

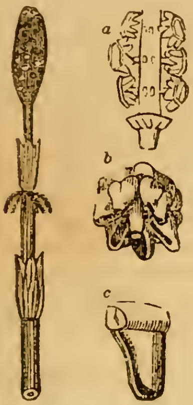
ACROGENS.

262. ACROGENS (from *akros* the *summit* or *point,*) have a regular stem or axis which grows by the extension of the point or apex only without increasing at all in diameter, generally furnished with leaves and composed of woody and vascular tissue. They embrace the following regular descending series of orders, called EQUISETACEÆ, FELICES, (with three suborders *Polypodineæ*, *Osmundineæ* and *Ophyoglosseæ,*) LYCOPODIACEÆ, and HYDROPTERIDES (with two sub-orders, *Marsileæ* and *Salvineæ*).

263. The Order EQUISETACEÆ (Horsetail Family,) has been placed at the head of the series on account of the resemblance which the organs of vegetation and the spikes of fructification bear to many Coniferæ. Equisetum, (Fig. 128,) exhibits hollow jointed stems, either simple or bearing whorled branches, and having the joints furnished with a toothed sheath instead of leaves. The fructification is a cone or spike

consisting of peltate scales which are attached around the axis, (Fig. 128, *a.*) each with several thecæ attached to its lower surface, longitudinally dehiscent. Spores numerous, with four elastic club-shaped bodies (of unknown use, called *elators*) wrapped around them.

128.



129.

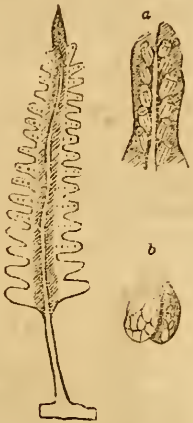


Fig. 128. Summit of the stem of Equisetum sylvaticum; *a*, part of the axis of the cone of fructification; *b*, some of the fruit-bearing organs, magnified; *c*, a separate *thecæ* more magnified.

Fig. 129. Polypodium vulgare; *a*, a division (pinna) of Schizæa pusilla, showing the sessile sporangia occupying its lower surface; *b*, one of the sporangia more magnified.

264. The large Order FILICES (Ferns, Fig. 129,) is remarkable for bearing the fructification upon the leaves, or as they are technically termed FRONDS. The fronds usually rise from subterranean root-stalks, separately rolled up, or circinate in the bud in a spiral form, and bearing the SPORANGIA upon the back or lower surface of the fronds, in the form of dots, which open in various ways and discharge the numerous minute spores.

265. The Order LYCOPODIACEÆ (Club-moss Family, consists of plants such as the *Club-moss* and *Ground Pine*, (Fig. 130,) with creeping or leafy stems, mostly branching. The fruit consists of sessile *thecæ* in the axils of the leaves, sometimes all collected at the summit under leaves which are changed

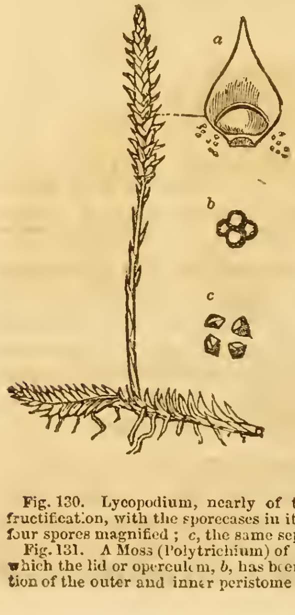
into bracts, and crowded into a kind of ament, 1 to 3 celled, dehiscent, containing either minute grains, appearing like fine powder, or a few rather large sporules; both kinds being often found in the same plant.

266. The Order HYDROPTERIDES consists of aquatic cryptogamous plants of diverse habits, with the fructification borne at the bases of the leaves, or on submerged branches, consisting of two kinds of organs, of dubious nature, contained in indehiscent, or irregularly bursting involucres, (*sporocarps*).

ANOPHYTES.

267. ANOPHYTES. Vegetables composed of parenchyma alone, with acrogenous growth, usually with distinct foliage, sometimes the stem and foliage is confluent into a frond. They embrace the following orders: MUSCI and HEPATICEÆ, (with four sub-orders *Ricciaceæ*, *Anthoceroteæ*, *Merchantiaceæ* and *Jungermanniaceæ*.)

130.



131.

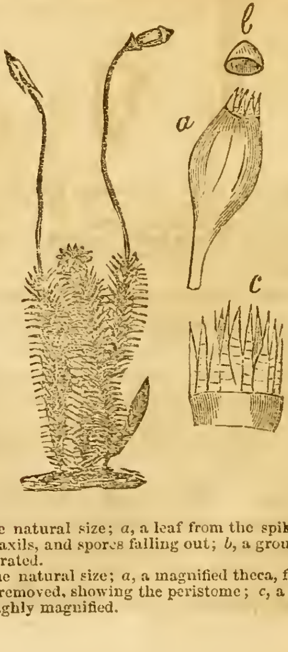


Fig. 130. Lycopodium, nearly of the natural size; *a*, a leaf from the spike of fructification, with the sporecases in its axils, and spores falling out; *b*, a group of four spores magnified; *c*, the same separated.

Fig. 131. A Moss (Polytrichium) of the natural size; *a*, a magnified theca, from which the lid or operculum, *b*, has been removed, showing the peristome; *c*, a portion of the outer and inner peristome highly magnified.

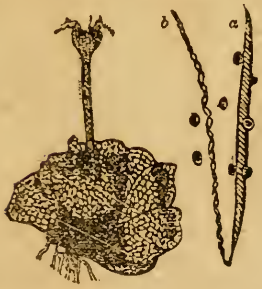
268. The Order **Musci** (Mosses, Fig 131,) consists of low tufted plants, always with a stem and distinct (sessile) leaves, producing sporecases which mostly open by a terminal lid, and contain simple spores alone.

269. The Order **Hepaticæ** (Liverworts, Fig. 132,) consists of frondose or Moss-like plants, of a loose cellular texture, usually procumbent, and emitting rootlets from beneath; the calyptra not separating from the base, but usually rupturing at the apex; the capsule not opening by a lid, containing spores, usually mixed with elaters which consist of thin thread-like cells, containing one or two spiral fibres, uncoiling elastically at maturity.

THALLOPHYTES.

270. Vegetables composed of parenchyma alone, or of congeries of cells or even of separate cells, often vaguely combined in a *thallus*, never exhibiting a marked distinction into root, stem, and foliage, or into axis and leaves. Fructification of the most simple kinds consisting of *sporules* or *sporidia*.

132.



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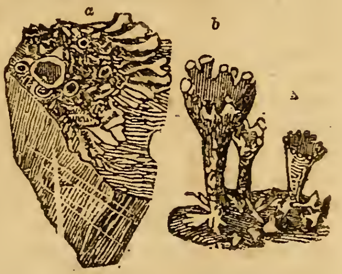


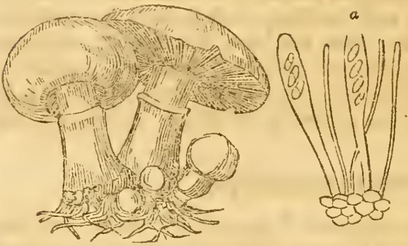
Fig. 132. Fruit-stalk, with a portion of the foliage of Jungermannia, magnified to show its entire cellular structure; *a*, one of the tubular spirally-marked cells from the fruit; *b*, the spiral threads which result from its disruption.

Fig. 133. *a*, a stone upon which a Lichen (Permellia conspersa) is growing; *b*, Cladonia coccinnea, bearing its fructification in rounded red masses on the edges of a raised cup.

271. The Order **Lichenes** (Lichens, Fig. 133,) form the highest grade of this lower series. They consist of flat expansions, which are rather crustaceous than foliaceous, growing on the bark of trees, on the surface of rocks, and on the ground, to which they cling by their lower surface. The

fructification is in cups, or shields (APOTHECIA) resting on the surface of the thallus, or more or less immersed in its substance, or else in powdery spots scattered over the surface.

134.



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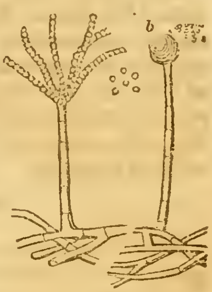


Fig. 134. Agaricus campestres, Edible Mushroom in its various stages; *a*, Asci, from the interior of Sphæria rosella, containing sporules highly magnified. Fig. 135. A Mould (Pennicillum glaucum); *b*, Bread-mould (Mucor , both highly magnified.

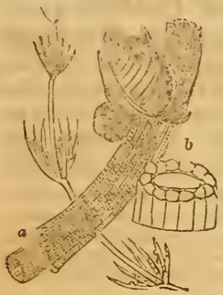
272. The Order FUNGI (Mushrooms, Moulds &c., Fig. 133, 134,) consists of parasitic flowerless plants, either living upon and drawing their nourishment from living, though more commonly from languishing, plants and animals, or else appropriate the organized matter of dead and decaying animal and vegetable bodies. Rust, Smut and Mildew, (Fig. 135,) are examples of the former, and Mushrooms, Puff balls, &c., of the latter. Fungi (Fig. 134,) are entirely destitute of foliage and green matter, (chlorophyll,) which appears to be essential to the formation of organic out of inorganic matter.

273. The Order CHARACEÆ (Chara Family,) consists of a few aquatic plants, which have all the simplicity of the lower Algæ, in cellular structure, being composed of simple tubular cells, placed end to end, and often with a set of smaller tubes applied to the surface of the main one. Their fructification consists of two kinds of bodies (shown in Fig. 136,) of which the smaller is problably a mass of antherideæ, of curious structure, while the upper and larger is a sporocarp formed of a budding cluster of leaves, wrapped around a nucleus which is a spore or *sporangium.*

274. The next vast Order or rather class, ALGÆ, consists mostly of aquatic plants. Although they rise to forms more simultating the higher grades of vegetation, and therefore

should have been placed before the Fungi, yet, as they descend to the very lowest points of the scale, they have been placed the last in the series.

136.



137.

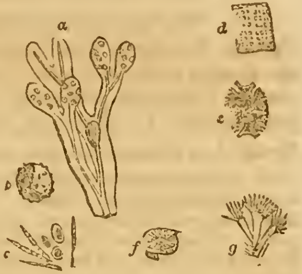


Fig. 136. Branch of the common Chara, nearly the natural size; *a*, a portion magnified, showing the lateral tubes inclosing a central one; also a spore, invested by a set of tubes twisted spirally around it, and with an antheridium borne at its base; *b*, a portion of the lateral tubes more highly magnified.

Fig. 137. *a*, summit of the frond of Fucus vesiculosus; *b*, one of the contained globules; *c*, spores and jointed filaments of which the globules are composed; *d*, Gonium glaucum, of Ehrenberg, who thinks it a congeries of animalcules, while it is described as an Algæ by Meyen; *e*. Euastrum Crux-Melitensis; *f*, Meridion circulare; *g*, Echinella flabellata, perhaps a group of animalcules.

275. The highest forms of the Algæ are the proper Seaweeds, "some of which have stems of enormous lengths, and fronds that rival in expansion the leaves of the Palm." "Others again are so minute as to be invisible, except in masses, to the naked eye." From those we descend by successive gradations to simple or branching cells placed end to end, such as the green Confervus of our ponds, and many marine forms, in which the organs of vegetation and fructification become at length perfectly identical, both reduced to mere cells, and finally as the lowest term of possible vegetation we have the plant reduced to a single cell, containing granular matter which gives rise to new ones, each of which at the destruction of its mother cell becomes an independent minium plant, and repeats in turn the same process."

276. "The lowest group of the Algæ, called DIATOMACÆ, presents peculiarities of the most striking resemblance to those of animals, so that they are claimed at the same time by the Zoologist as well as the Botanist. We see not how they are to be separated from the vegetable kingdom, espe-

cially if they evolve oxygen gas as they are said to do. But, wherever the line be drawn, in reaching the borders of the vegetable kingdom, we make the closest possible approach to the lowest confines of the animal creation!"

FOOD AND NUTRITION OF PLANTS.

277. The essential and ultimate constituents of plants are Carbon, Nitrogen, Hydrogen, and Oxygen. These elements are always present in plants, and produce by their union the various proximate principles of which they consist. They are indispensable to vegetation, and compose at least from eighty-eight to ninety-nine *per cent.* of every vegetable substance.

278. *Carbon* (familiarly known as charcoal,) is an elementary substance endowed with a considerable range of affinity. With oxygen it unites in two proportions, forming carbonic acid and carbonic oxide. Carbon enters so largely into the composition of plants, that it retains the exact form and texture of the wood, after the other ingredients have been expelled by heat. Its proportion is from 40 to 60 *per cent.*

279. *Hydrogen* is a very important constituent of vegetable matter. It possesses a special affinity for oxygen, with which it unites and forms water. The whole phenomena of the decay of organized matter depends upon the exercise of this affinity, and many of the processes engaged in the nutrition of plants originate in the attempt to gratify it. Water is the most common combination in which it is presented; and it may be separated by various processes from the oxygen, with which it is united in this body.

280. *Nitrogen* is quite opposed in its chemical characteristics to the bodies just described. Its principal characteristic is an indifference to all other substances. and an apparent reluctance to enter into combination with them. When forced by peculiar circumstances to do so, it seems to remain in the combination by a *vis inertiæ;* and very slight forces effect the disunion of these feeble compounds.

Yet nitrogen is an invariable constituent of plants, and during their life is subject to the control of the vital powers. But when the mysterious principle of life has ceased to exercise its influence, this element resumes its chemical character, and materially assists the decay of vegetable matter by escaping from the compounds of which it formed a constituent.

281. *Oxygen*, the only remaining constituent of organic matter, is the most generally diffused substance on the surface of the earth; for, besides constituting the principal part of the atmosphere which surrounds us, it is a component of almost all the earths and minerals found on its surface. It is slightly soluble in water, and hence it is usually found dissolved in rain and snow, as well as in the water of running streams.

282. Such are the principal characters of the elements which compose organic matter. Besides these four universal elements, many other substances, earthy and mineral, are found in quantities greater or less in different species. Thus, forest trees and most inland plants yield potassa; marine plants, soda, iodine, &c.; the Grasses, silex and phosphate of lime; Rhubarb and Sorrel, oxalate of lime; Leguminous plants, carbonate of lime. These substances form the ashes which are left on burning a leaf or a piece of wood.

283. These four elements carbon, hydrogen, nitrogen,

and oxygen, must be furnished by the food upon which the vegetable lives, and must be obtained from sources without. These sources are obviously *air*, *earth* and *water*.

284. The composition of the atmosphere has been carefully examined by many chemists, and the result of their researches has shown, that its principal constituants are always present in the same proportion. One hundred parts by weight, of atmospheric air, contain 23.1 parts of oxygen, and 76.9 parts of nitrogen; or 100 volumes of air contain nearly 21 volumes of oxygen gas.

285. Although oxygen and nitrogen are the principal constituants of the atmosphere, they are not the only substances found in it. Watery vapor, carbonic acid, and ammonia, materially modify its properties. The former of these falls upon the earth as rain, and brings with it whatever soluble matter it meets in its passage through the atmosphere. Carbonic acid is contained by the atmosphere in the proportion of 1 to 1000, diffused throughout the whole extent; and as this gas is the principal food of plants, (for it contains 27 *per cent.* of carbon), it may be demonstrated that the whole atmosphere contains at least 3306 billion pounds, besides the vast quantity derived from other sources, such as the combustion and decay of organic matter. It is likewise discharged in immense quantities from the active volcanoes of South America, and mineral springs which abound in various parts of Europe—affording an amount fully adequate to the vast and ceaseless drain made upon it by the vegetable kingdom.

286. *Ammonia*—which is generated in the atmosphere, during thunder storms, by the flashes of the electric fluid, and likewise arises from the decomposition of organic matter—is composed of 100 volumes of nitrogen united with 300 volumes of hydrogen. In its gaseous form it is capable of entering into combination with carbonic acid and forming a volatile salt. Ammonia in all its volatile compounds as well as its gaseous form, is of extreme solubility in water. It can not, therefore, long remain in the atmosphere, as every shower of rain must condense it, and convey it to the surface of the earth. Hence rain-water must at all times contain more or less ammonia. The rain of a thunder storm, after a long-protracted drought, ought for this reason to contain the greatest quantity which is conveyed to the earth at one time, which accounts for the luxuriant growth of plants immediately after a thunder shower.

287. *Soil* consists of two classes of materials; namely, mineral and organic. The former, called earth, consists of disintegrated and decomposed rocks, containing potassa, soda, silica, lime, &c., all of which are more or less soluble in water, and enter into the composition of plants. The organic materials consist of the remains of former tribes of animals and vegetables, mingled with the earth, which, after having access to the air are decomposed, evolving carbonic acid and ammonia both to the air and the water.

288. *Virgin soil* in the form of vegetable mould or *humus*, appears to play such an important part in the phenomena of vegetation, that vegetable physiologists have been induced to ascribe the fertility of every soil to its presence. It being the product of the decay of vegetable matter, must, therefore, contain many of the constituents which are found in plants during their life.

289. *Water* The remaining source of vegetable food, is composed of oxygen and hydrogen, nearly in the proportion of 8 to 1; or, 100 parts of pure water consists of 88.9 parts of oxygen and 11.1 of hydrogen. Water, besides supplying these two essential elements, serves another important office, that of conveying to the roots the requisite supply of nitrogen, either separately or in the form of ammonia, and of carbon in the form of carbonic acid, as well as various mineral substances which it holds in solution after percolating through the soil.

290. While most plants are dependent on water, earth, and air, for their nourishment, absorbed by the roots and leaves, yet, the essential *elements,* the whole *proper food* of plants, may be absorbed by the leaves directly from the air, as in the state of gas or vapor. A vigorous branch of the common Live-for-ever (Sedum telphinem,) or of many such plants, will live and grow for a whole summer when pinned to a dry, bare wall; and the Epiphytes, or Air-plants must derive their whole sustenance immediately from the air; for they have no communication with the ground. Although leaves in some cases absorb nourishment directly from the air, as a general thing, their peculiar office is something quite different.

291. The *aqueous vapor,* condensed into rain or dew, and bringing with it to the ground a portion of *carbonic acid,* and *nitrogen* or *ammonia &c.,* supplies the appropriate food of the plant to the rootlets. Imbibed by these, it is conveyed through the stem and into the leaves, where the now superfluous water is restored to the atmosphere by exhalation, while the residue is converted into the proper nourishment and substance of the vegetable.

292. After all these materials have been supplied to the plant, still two other agents are requisite, without which the great work of vegetation can not proceed. These life-giving principles are *light* and *heat,* both of which emenate in floods from the sun. Under their influence the *raw material* is received into the vessels of the plant, and assimilated to its own substance.

293. Under the influence of light, the leaves imbibe carbonic acid, decompose it, retain the carbon and return pure oxygen to the air. Next, *chlorophyll* is developed, clothing the plant in living green. Meanwhile *lignen* is produced, the peculiar principle of tissue, whether cellular, vascular, or woody, consisting of carbon with the exact elements of water.

294. A portion of the plant's food instead of being immediately converted into new cells, new branches, &c., is accumulated in an elaborated state for future use, in the form of *gum, mucilage,* or *dextrine,* and is usually stored up in the form of starch, either in the root, or in the subterranean portion of the stem, or in the wood &c., as in the root of the beet, tuber of the potato, and in the fruit of almost all plants.

SYSTEMATIC BOTANY.

PART II.

295. Systematic Botany is the "science of arranging plants in such a manner that their names may be ascertained, their affinities determined, their true place in the natural system fixed, their sensible properties judged of, and their whole history elucidated with certainty and accuracy." All botanists, whatever may be their views as to the mode and order in which the members of the vegetable kingdom are to be arranged, agree in dividing into *Species*, *Genera*, *Orders*, and *Classes*.

296. A SPECIES, or particular sort, embraces all those individuals, which, although they may differ slightly in size and color or such unimportant respects, are identical in their real characteristics, resembling each other more nearly than they resemble any other plant, and produce from their seeds other plants wholly resembling the parent. Individuals from the same parent often bear flowers differing in color, or fruit differing in flavor, or leaves differing in form, such as the different varieties of apples, which all belong to the genus *Pyrus*, species *malus*; such differences are called *varieties*. They are never permanent, but exhibit a constant tendency to revert to their own original type.

297. A GENUS is an assemblage of nearly related species, agreeing with each other in general structure and appearance more closely than they accord with any different species. Thus, the White Oak, Black Oak, Scarlet Oak, and others, constitute the genus Quercus; the various species of Roses compose the genus Rosa; so the different Poplars, Willows, Pines, &c., form so many separate genera. These

genera are arranged into still higher, therefore fewer groups. In the natural system these groups are formed by the union of related genera, just as genera are formed by the union of related species and are called FAMILIES or ORDERS. Thus the Rose, Raspberry and Strawberry, with the Apple, Thorn, Plum, Cherry, &c., all agreeing in their general plan of structure are brought together into one order, or family, and called ROSACEÆ, that is, rose-like plants. When certain minor groups exist they are termed Suborders or Tribes. Thus the Plum, Cherry, Peach, &c., form one suborder of Rosaceæ; the Raspberry, Strawberry, Cinquefoil, Rose, &c., constitute another suborder; and the Apple, Quince, Thorn, &c., a third.

298. CLASSES are groups of orders having certain marked characters in common, but in a higher point of view. These in like manner with the other divisions are separated in SUB-CLASSES.

299. An enumeration of the points of difference, or marks of distinction of any one of these groups, whether of higher or lower order, is denominated its *character*. Thus the character of a class describes only those important points of structure on which it is founded; that of orders notices the general structure of the plants embraced in it, especially of the fruits and flowers; the generic character, the particular modification of the ordinal character in a given genus; and lastly, the specific character gives those of less importance, of form, color, &c., which mark it as distinct from its kindred.

300. There are two independent and widely different systems of classifying the genera, which have been followed; one the Artificial founded by Linnæus, and at one time almost universally followed by botanists; the other, the Natural, originally sketched out by Jussieu. The former has for its basis those characters which are derived from the organs of fructification, leaving all the affinities out of view. Its arrangement is truly ingenious and beautiful, and furnishes perhaps the readiest mode of determining the names of plants which has ever been devised, but this must be regarded as its principal use. The latter on the contrary is founded upon all those natural affinities and resemblances of plants by which the God of Nature has distinguished them into groups and families. In acquiring a thorough knowledge of the vegetable kingdom, the Natural System is not only the best, but

most accurate method which can be relied upon for the purpose. By the labors of De Candolle and Lindley in Europe, and Drs. Torrey and Gray of our own country, the misconceptions and obscurity that formerly embarrassed the science have been so far removed, that it is now brought within the scope of the ordinary mind, and is shown to be founded in true Philosophy.

301. Yet the difficulty attending analysis by the Natural System is too great to be successfully encountered by the young student in the science. On this account I have thought it best to arrange the genera under the Linnæan classes and orders, describe the most prominent characters of each, and refer to the page where, and in what Natural Order, his specimen is to be found.

LINNÆAN SYSTEM.

302. By the Linnæan System the Vegetable Kingdom is divided into twenty-four CLASSES, (twenty-one of which, are now in general use). These are distinguished from each other by the number, situation, connection, proportion, presence or absence of the *stamens*, so that the arrangement is founded entirely on the flower of the plant.

303. The Classes are divided into ORDERS; these are founded either on the number of styles or pistils, (in some instances on the number of stamens,) situation of the fruit, the kind of pericarps, or on some other circumstance which will be explained in its proper place. The names of the classes and orders are derived from the Greek, designating their modifications and expressing their characters as follows:

CLASS 1. **Monandria**, (*monos*, one, and *andria*, from *aner*, which is used metaphorically for stamens,) includes all such plants with one stamen to the flower.
" 2. **Diandria**, those with two stamens.
" 3. **Triandria**, those with three stamens.
" 4. **Tetrandria**, those with four stamens.
" 5. **Pentrandria**, those with five stamens.
" 6. **Hexandria**, those with six stamens.
" 7. **Heptandria**, those with seven stamens.
" 8. **Octandria**, those with eight stamens.
" 9. **Enneandria**, those with nine stamens.
" 10. **Decandria**, those with ten stamens.
" 11. **Dodecandria**, those with twelve to nineteen stamens.
" 12. **Icosandria**, those with more than ten stamens inserted on the calyx (perigynous).
" 13. **Polyandria**, those with more than twenty stamens situated on the receptacle (hypogynous).

" 14. DIDYNAMIA, those with two long and two short stamens.
" 15. TETRADYNAMIA, those with four long and two short stamens.
" 16. MONODELPHIA, (a single fraternity) with the filaments united into a single set, tube, or column.
" 17. DIADELPHIA, (two fraternities,) with the filaments united into two sets or parcels.
" 18. POLYADELPHIA, (many fraternities,) with the filaments united in more than two sets or parcels.
" 19. SYNGENESIA, (to grow together) with the anthers united into a ring or tube.
" 20. GYNANDRIA, (union of stamens and styles) with the stamens and styles consolidated.
" 21. MONŒCIA, (one house-hold) includes plants, where the stamens and pistils are in separate flowers on the same plant.
" 22. DIŒCIA, (two house-holds) where they occupy separate flowers on different individuals.
" 23. POLYGAMIA, (many marriages) where the stamens and pistils are separate in some flowers and united in others, either on the same or two or three different plants.
" 24. CRYPTOGAMIA, (concealed stamens and pistils,) includes those genera of plants where the stamens and pistils are wanting, or at least invisible, and embraces the Ferns, Mosses, Lichens, &c., which are now called Cryptogamous, or Flowerless plants.

304. The Orders in the first thirteen classes of the Linnæan artificial system, depend on the number of styles, or of the stigmas in the absence of styles; and are likewise named by having Greek numerals prefixed to the word *gynia*, used metaphorically for pistils, as follows.

ORDER 1. MONOGYNIA, embraces all plants of any of the first thirteen classes, with one style to the flower.
" 2. DIGYNIA, those with two styles.
" 3. TRIGYNIA, those with three styles.
" 4. TETRAGYNIA, those with four styles.
" 5. PENTAGYNIA, those with five styles.
" 6. HEXAGYNIA, those with six styles.
" 7. HEPTAGYNIA, those with seven styles.
" 8. OCTAGYNIA, those with eight styles.
" 9. ENNEAGYNIA, those with nine styles.
" 10. DECAGYNIA, those with ten styles.
" 11. DODECAGYNIA, those with eleven or twelve styles.
" 12. POLYGYNIA, those with more than twelve styles.

305. The Orders of the remaining classes are founded upon characters not depending upon the number of styles, as follows: The Orders of Class 14, Didynamia, are only two, namely:

1. GYMNOSPERMIA, (seeds naked) the achenia-like fruits appear like naked seeds.
2. ANGIOSPERMIA, with the seeds evidently in a seed vessel.

The 15th Class is likewise divided into two orders which are distinguished by the form of the pod:

1. SILICULOSA, bearing seeds in a silicle or short pod.
2. SILIQUOSA, fruit a silique or long pod.

The orders of the 16th Class *Monodelphia*, 17th *Diadelphia*, 18th *Polydelphia*, 20th *Gynandria*, 21st *Monœcia*, and 22d *Diœcia*, depend merely on the number of stamens; that is on the character of the first thirteen classes, whose names they likewise bear; thus—

ORDER 1. MONANDRIA,
" 2. DIANDRIA, and so on.

The orders of the 19th Class, *Syngenesia*, are six, namely:

1. POLYGAMIA ÆQUALIS, where the flowers are in heads (compound,) and all perfect.
2. POLYGAMIA SUPERFLUA, the same as the last, except that the rays or marginal flowers of the head are pistillate only.
3. POLYGAMIA FRUSTRANEA, those with the marginal neutral, the others perfect.
4. POLYGAMIA NECESSARIA, where the marginal flowers are pistillate, and fertile, and the central staminate and sterile.
5. POLYGAMIA SEGREGATA, where each flower of the head has its own proper involucre.
6. MONOGAMIA, when solitary flowers (not united into a head) have united anthers, as in Lobelia. This order was abolished by succeeding botanists, but upon insufficient grounds.

The 23rd Class *Polygamia*, has three orders, founded on the characters of the two preceding classes, namely:

1. MONŒCIA, when both separate, and perfect flowers are found in the same individual.
2. DIŒCIA, when the different flowers occupy different individuals.
3. TRIŒCIA, where one individual has the perfect, another the staminate, and a third the pistillate flowers.

The orders of the 24th Class, *Cryptògamia*, are natural, and therefore indefinable by a single character. They are,

1. FILICES, the Ferns.
2. MUSCI, the Mosses.
3. ALGÆ, which as left by Linnæus, comprised the Hepaticæ, Lichens, &c. as well as Seaweeds.
4. FUNGI, Mushrooms, &c.

THE NATURAL SYSTEM.

306. The great object of the Natural System is to arrange and bring together into groups such plants which most nearly resemble each other, in all essential particulars, and

to combine the subordinate groups into larger natural assemblages, and these into still more comprehensive divisions so as to embrace the whole vegetable kingdom within the limits of a systematic arrangement.

307. Numerous systems have been devised, and proposed by different authors, founded on the peculiar views of the devisers. Some writers, as Jussieu, &c., commence their exposition with the lowest order, and gradually ascend to the highest; whilst others, as De Candolle, Torrey and Gray, &c., begin with the highest and most perfect organization, and descend to the lowest or least organized. This system has been adopted in the following pages, being the most generally known and followed.

PRIMARY DIVISIONS OF THE VEGETABLE KINGDOM.

308. The Vegetable Kingdom taken as a whole is primarily divided into two great natural divisions, namely: PHÆNOGAMIA or FLOWERING PLANTS, and CRYPTOGAMIA, or FLOWERLESS PLANTS.

309. The PHÆNOGAMIA,

1. *Consist of a regular axis of growth with leafy appendages.*
2. *They possess a woody and vascular structure.*
3. *They produce flowers, essentially with stamens and pistils, and—*
4. *They produce seeds.*

310. The CRYPTOGAMIA,

1. *Are destitute of a regular axis of growth and of true leaves.*
2. *They generally possess a cellular structure only.*
3. *They do not develope flowers, and—*
4. *They produce spores instead of seeds.*

311. The Phænogamia are again naturally divided into two sub-divisions, depending upon their manner of growth, termed EXOGENS and ENDOGENS, whose leading distinctions are as follows:

CLASS I. EXOGENS—

1. *Stems increasing by external accretions.*
2. *Leaves usually articulated with the branches, and having reticulated veins.*
3. *Embryo with two or more cotyledons, or dycotyledonous.*

CLASS II. ENDOGENS—

1. *Stems increasing by internal accretions.*
2. *Leaves seldom articulated, usually sheathed at the base, with simple parallel veins.*
3. *Embryo with one cotyledon, or monocotyledonous.*

312. The two groups or classes above mentioned, embracing all the Phænogamia, are again divided into subclasses. The first are formed from the sub-division Exogens, and are founded upon the presence or absence of the pericarp, namely:

Sub-Class I. ANGIOSPERMS—

1. *Ovules, produced in a closed ovary.*
2. *Fertilized by the action of the pollen through the stigma.*
3. *Embryo with two opposite cotyledons.*

Sub-Class II. GYMNOSPERMS—

1. *Ovules produced beneath a scale-like carpel.*
2. *Fertilized by the direct action of the pollen without the stigma, becoming seeds destitute of a pericarp.*
3. *Embryo generally with several whorled cotyledons.*

313. The next two sub-classes are formed from the subdivisions of Endogens, and depend upon the presence and absence of glumes or husks, namely:

Sub-Class III. AGLUMACEÆ, or AGLUMACEOUS ENDOGENS—

Plants of the endogenous structure, with flowers constructed on the usual plan; perianth verticellate, consisting of one or more whorls of petaloid organs, or wanting.

Sub-Class IV. GLUMACEÆ, or GLUMACEOUS ENDOGENS—

Plants of the endogenous structure, with the flowers invested in an imbricated perianth of glumes instead of a calyx.

314. The third Class forms the connecting link between the Flowering and Flowerless plants, combining a part of the characters of each. *They possess a cellular structure, develope flowers immediately from the roots, and the pericarp contains spores instead of seeds;* hence they are called RHIZANTHS or SPOROGENS. Ex.: Rafflesia. As we have no representative of this class in our country, I shall take no further notice of it in the regular series of classes.

315. The Cryptogamia are separated into three great classes, called ACROGENS, ANOPHYTES, and THALLOPHYTES.

CLASS III. ACROGENS—

Plants with a distinct stem or axis, growing by the extension of the point, or apex only, containing woody fibre and vessels, and usually with distinct foliage.

CLASS IV. ANOPHYTES—

Acrogenous plants, growing upwards by an axis or stem, usually furnished with distinct leaves (sometimes the stem and foliage confluent into a frond,) *composed of cellular tissue alone.*

CLASS V. THALLOPHYTES—

Consisting of cellular tissue, with a tendency to grow into a flat expansion, called thallus, but having no distinction of root, stem, leaves, or flowers.

316. The general plan may be analytically expressed by the diagram on the following page.

317. DIVISIONS. The classes and sub-classes are next to be broken up into smaller divisions, groups, and alliances, for convenience of analysis. For this purpose, the great class of Exogenous plants is usually broken up into three very convenient divisions, founded on the presence, absence, or union of the petals, namely:

1. POLYPETALÆ, the Polypetalous Exogens; where the calyx and corolla are both present, and the latter composed of distinct petals.
2. MONOPETALÆ, the Monopetalous Exogens; flowers with united petals.
3. APETALÆ, the Apetalous Exogens; flowers with no floral envelopes, or with a calyx only.

318. These divisions, as well as the other classes, are variously subdivided by different authors, which is not necessary to specify, since it is only the classes and the orders that are considered to be founded on a firm basis.

319. ORDERS or FAMILIES, are the most important of all the natural associations. On the accuracy and distinctness of their characters, botanists have bestowed the highest degree of attention. The orders differ very widely in regard to their extent; while some consist of a single genus, as Sarreceniaceæ, others embrace hundreds of genera, as Compositæ. For the sake of convenience, the larger orders are divided into sub-orders or tribes.

NOMENCLATURE.

320. The names of ORDERS are always plural, and sometimes are founded on some characteristic feature of the group;

SYNOPTICAL VIEW OF THE FIVE CLASSES OF THE NATURAL SYSTEM.

SERIES I. FLOWERING PLANTS.	CLASS I.	Exogens or Dicotyledons.	
		Sub-class 1. *Angiosperms*, seeds in a pericarp. Ex.: Oak, Rose.	
		" " 2. *Gymnosperms*, seeds naked. Ex.: Pine, Yew.	
	CLASS II.	Endogens or Monocotyledons.	
		Sub-class 3. *Aglumaceæ*, without glumes. Ex.: Lily, Rush.	
		" " 4. *Glumaceæ*, with glumes. Ex.: Grasses, Grains.	
SERIES II. FLOWERLESS PLANTS.	CLASS III.	Acrogens, woody and vascular tissue. Ex. Ferns.	distinct axis, stem & foliage.
	" IV.	Anophytes, cellular tissue only. Ex.: Mosses.	
	CLASS V.	Thallophytes, no distinction of stem and foliage. Ex.: Lichens.	

as, for instance *Leguminosæ*, or the Leguminous plants, such as the Pea, Bean, &c.; *Cruciferæ*, plants which have the four petals somewhat in the form of a cross, such as the Radish, Turnip, &c. But more frequently, as a general rule, the name is formed from that of a leading genus, which is prolonged in the adjective termination, *aceæ*. Thus the plants of the order which comprises the rose (*Rosa*), are called *Rosaceæ*, that is *Plantæ Rosaceæ*, or Rosaceous plants; those of which the Lily is the representative, are *Liliaceæ*, or Liliaceous plants, &c.

321. Generic names are Latin substantives, in the singular number, and mostly of Greek or Latin derivation. Those which were known to the ancients, generally preserve their classical appellations. (Ex.: *Fagus, Prunus, Myrtus, Viola, &c.*) Some are formed from some medicinal virtue, either supposed or real; others from the native country of the plants, or from the name of some distinguished Botanist, or patron of botany, to whom the genus is thus said to be dedicated.

322. Specific names, as a general rule, are Latin adjectives, written after those of the genera, and established on similar principles; as *Magnolia grandiflora*, the large flowered Magnolia; *M. macrophylla*, the large leaved Magnolia. Specific names sometimes distinguish the country which a plant inhabits, or where first discovered, as *Viola Canadense, &c.*; or the place where it naturally grows, as *Viola palustris*, which grows in swamps, &c.; *arvensis*, in fields, &c.; or they express some obvious character of the species, as *Viola ratundifolia*, with round leaves, &c. Frequently, the species is named after some other genus, which in some respect it resembles, as *Viola primulæfolia*, Primrose-leaved Violet. *Gerardia quercifolia*, Oak-leaved Gerardia, &c.

323. Species, like genera, are also sometimes named in commemoration of distinguished persons. When it bears the name of the discoverer or describer, it takes the genitive form, as *Lobelia Kalmii*; *Viola Muhlenbergii*; *V. Nuttallii, &c.* When such names are merely given in compliment to persons to whom they are dedicated, unconnected with the history or discovery of the plant, the adjective form is adopted; as *Carex Torreyana*; *C. Hookeriana, &c.* Specific names are sometimes substantives, as *Hypericum, Sorothra, Ranunculus, Flammula, &c.*; when they do not necessarily

accord with the genus in gender. These, as well as all specific names derived from those of persons or countries, should always be written with a capital initial letter. The generic and specific names, taken together, constitute the proper scientific appellation of the plant.

BOTANICAL ANALYSIS.

324. "The application of the rules of Systematic Botany to the natural plant, in order to ascertain its affinities, place, name, &c., is called *botanical analysis.*

325. In order to be in a proper state for this kind of examination, plants should be in full blossom, and fresh, that is, not withered or decayed. A good lens is requisite for the examination of the minute parts of the structure, or of the flower.

326. The analysis of plants is a constant object of pursuit with the practical botanist. Without this exercise, the study of authors will be of little avail. A more accurate and useful knowledge of a plant can be acquired in a few minutes, by a careful examination of the living specimen, or even of the *dried*, than by committing to memory the most elaborate descriptions found in books. During the flowering month, the learner will often in his walks meet with plants in blossom, with which he is yet unacquainted. And he who is duly interested in his pursuit, will by no means fail to seize and analyze each specimen while the short hour of its bloom may last, and to store his memory with the knowledge of its names, habits, and uses. Thus, in a few seasons, or even in *one*, he will have grown familiar with nearly, or quite, every species of plants in his vicinity.

327. Let us now suppose the pupil in possession of a specimen of an unknown plant in full blossom. In order to study it by the aid of authors, a point immediately requisite is its name. Now, having learned by examination the organic and physiological structure of the flower, leaves, stems, &c., the experienced botanist, who has at his command the characters of all the Natural Families, will at once determine to which of them the plant belongs."

328. But this is not to be expected of the pupil who is supposed to be yet, in a measure, unacquainted with the characters of the orders. He must be guided to the place which his specimen holds in the classification, by a longer course

of inquiry and comparison. For the assistance of the learner, therefore, and for the convenience of all, I have added a full series of *Analytical Tables*, in which the genera described in this work are arranged under the Classes and Orders of the Linnæan Artificial System.

OF COLLECTING AND PRESERVING PLANTS.

329. Students in botany should give an early and persevering attention to the collection and preservation of as many species of plants as they can procure. The advantages to be derived from such collections are great, and will afford an abundant compensation for all the labor required, either in refreshing the memory by reviewing them, or in instituting a more thorough examination at one's leisure.

330. Such a collection of specimens of plants, preserved by drying under pressure between folds of paper, is termed a *Herbarium*, or by the more significant title *Hortus Siccus* (dry garden).

331. A complete specimen consists of one or more shoots, bearing the leaves, flowers, and fruit, and in some cases, as in herbaceous plants, a portion of the root should also be preserved.

332. Specimens intended for the herbarium, should be gathered, if possible, in a dry day, and carried either in a close tin box, about 20 inches long and 3 or 4 in diameter, or in a strong portfolio, containing a quire or more of firm paper, with a few sheets of blotting paper to receive the delicate plants. They must be dried under a strong pressure, but not so as to crush the parts, between dryers composed of 6 to 10 thicknesses of paper, that will absorb moisture, which should be changed once or twice a day, until all the moisture is extracted from the plants—a period which varies from 3 to 10 days. All delicate specimens should be laid in folded sheets of thin and smooth bibulous paper, and placed between the dryers, and so transfered entire, from time to time without being disturbed, until perfectly dry.

333. Many plants prepared by the above method, will in most instances retain their colors almost as perfect as when first gathered, yet some plants, especially those of the endogenous structure, such as the Narcissus, Iris, &c., are very hard to dry so as to retain their coloring. I have found the following method to answer a very good purpose :

treat the specimens as above directed, and leave them in the papers for 1 or 2 days, then place them between several thicknesses of dry blotting paper, and pass over them with a hot iron, at intervals from 1 to 5 minutes, until dry, taking care to shift them into dry paper as soon as the paper around them becomes moist.

334. The dried specimens are next to be arranged in their respective genera, orders, and classes, properly labelled with the names, locality, &c., and laid either in separate or double sheets, or each species fastened with glue, or otherwise on a half sheet of good white paper.* These can be collected in folios sufficiently large to contain each natural order, or artificial class, and labelled accordingly on the outside, received into the compartment of a cabinet, with close doors, and kept in a sufficiently dry place.

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* I have found the following mixture to answer a very good purpose for fastening plants. Take of Gum Arabic 1 ounce, Izinglass 1 ounce, dissolve them in ½ pint of water by boiling over a gentle heat, after which add 1 ounce Tincture of Camphor, incorporating them well by shaking; then spread some of it on a plate of glass large enough to receive the specimen intended to be fastened, lay it on the glass, pressing it down so as to receive a coating all over the under surface, then transfer it to the paper where it is to be fastened, cover with 1 or 2 thicknesses of dry paper and pass over it with a hot iron until dry.

PRINCIPAL ABBREVIATIONS OF THE NAMES OF AUTHORS.

Adans.	Adanson.
Agh.	Agardh.
Ait.	Aiton.
Arn.	Arnott.
Bart.	Barton.
Benth.	Bentham.
Berl.	Berlandier.
Bernh.	Bernhardi.
Brongn.	Brongniart.
Bigl. *or* Bw.	Bigelow.
Boehm.	Boehmer.
Bong.	Bongard.
Br.	Brown.
Cass.	Cassini.
Cav.	Cavanilles.
Chav.	Chaviennes.
Darl.	Darlington.
DC.	De Candolle.
Desf.	Desfontaines.
Desv.	Desvaux.
Dew.	Dewey.
Dill.	Dillenius.
Duh.	Duhamel.
Endl.	Endlicher.
Ehrh.	Ehrhart.
Ell.	Elliot.
Engel.	Engelman.
Forsk.	Forskahl.
Frœl.	Frœlich.
Gært.	Gærtner.
Ging.	Gingins.
Gmel.	Gmelin.
Good.	Goodenough.
Grev.	Greville.
Grisc.	Grisebach.
Gron.	Gronovious.
Hedw.	Hedwig.
Hoffm.	Hoffman.
Hook.	Hooker.
Huds.	Hudson.
Jacq.	Jacquin.
Juss.	Jussieu.
Lam.	Lamarck.
Lamb.	Lambert.
Lec.	Le Conte.
Lindl.	Lindley.
L'Her.	L'Heritier.
Linn.	Linnæus.
Lk.	Link.
Lehm.	Lehman.
Mart.	Martius.
Mentz.	Mentzel.
Michx.	Michaux.
Mill.	Miller.
Mirb.	Mirbel.
Mitch.	Mitchell.
Mœnch.	Mœnchausen.
Muhl.	Muhlenberg.
Nees.	Nees von Esenbeck.
Nutt.	Nuttall.
Pall.	Pallas.
Pav.	Pavon.
Pers.	Persoon.
Poir.	Poiret.
Ph.	Pursh.
Rœm.	Rœmer.
Raf.	Rafinesque.
Rich.	Richard.
R. Br.	Robert Brown.
Salisb.	Salisbury.
Schw.	Schwenitz.
Schk.	Schkuhr.
Scop.	Scopoli.
Ser.	Seringe.
Sm.	Smith.
Spr.	Sprengel.
Sulliv.	Sullivant.
Sw.	Swartz.
Tayl.	Taylor.
T. & G.	Torrey & Gray.
Torr.	Torrey.
Tourn.	Tournefort.
Traut.	Trautvetter.
Vaill.	Vaillent.
Wahl.	Wahlenberg.
Walt.	Walter.
Willd.	Willdenow.

GLOSSARY OF BOTANICAL TERMS,

COMBINED WITH AN

INDEX

TO THE FIRST PART OF THE WORK.

(The numbers refer to the paragraphs in the preceding part.)

A, and ana, in composition; destitute of; as Apetalous, without petals.

Abnormal; different from the customary structure.

Abortion; an imperfect developement of any organ.

Abortive; not arriving at perfection.

Abrupt; terminating suddenly.

Abruptly-pinnate. Fig. 49.

Acaulescent; stemless, apparently without a stem.

Accessary; additional, or supernumerary.

Accumbent; lying against any thing; applied to the radicle when it lies against the edge of the cotyledons.

Accrose; needle-shaped.

Achenium; a small dry indehiscent pericarp. Fig. 121.

Achlamydeous; without calyx and corolla.

Acicular; bristle-shaped.

Acine, (Acinus); each separate grain of a collective fruit, like the raspberry.

Acotyledonous; destitute of cotyledons.

Acrogens; growing by the extension of the point; 262.

Aculeate; prickly.

Acuminate; ending in a curved, tapering point. Fig. 61.

Acute; sharp, not rounded.

Adelphia; a fraternity.

Adherent; sticking fast, or growing fast to, as *adnate.*

Albumen; 230.

Alburnum; sap-wood; 74.

Alternate; not opposite.

Alveolate; having cells like a honey-comb.

Ament; Fig. 81.

Amentaceous; having aments.

Amorphous; having no definite form.

Amplexicaul; clasping the stem.

Anastomose; applied to branching vessels which inosculate, or unite again like net-work.

Anatropous; inverted.

Ancipial; 2-edged.

Andræcium; 191.

Androgynous; having staminate and pistillate flowers distinct.

Androus; refers to stamens.

Angiospermous; the seeds in a pod.

Angulate; having angles or corners.

Annual; living or enduring but one year.

Annular; having the form of a ring.

Anomolous; not according to rule or system.

Anophytes; vegetables composed of parenchyma alone, 267.

Anterior; same as inferior; applied to sepals, petals, or other organs which in axillary flowers lie next the bract, or outward.

Anther; the knob-like body, mostly borne on the filament. 193.

Antheridia; applied to minute cylindrical sacs or sterile flowers, of cryptogamous plants.

Apetalous; destitute of petals.

Apex; the summit end, or point.

Aphyllous; without leaves.

Apocarpous; having the carpels distinct.

Appendiculate; furnished with appendages.

Appressed; lying flat against.

Approximate; growing, or situated near each other.

Aquatic; growing naturally in water, or wet places.

Arachnoid; resembling a spider's web.

Arborescent; tree-like.

Arcuate; curved or bent like a bow.

Areolæ; little spaces, circumscribed by meshes.

Arid; dry or parched.

Aril, or Arillus; a loose coating of some kinds of seed, as the mace of the nutmeg.

Aristate; having awns.

Armed; having thorns or prickles.

Arrow-shaped; Fig. 37.

Articulated; jointed.

Ascending; rising from the ground obliquely.

Assimilation; 146.

Assurgent; rising in a curve from a declined base.

Attenuate; tapering gradually until it becomes slender.

Auriculate; having rounded appendages at base, like ears. Fig. 35.

Awn; a slender bristle-like process, common on the chaff of grasses.
Axil; the angle between a branch and a stem or leaf & branch, on the upper side.
Axis; a central stem, or any centre around which parts are arranged.

Baccate; berry-like.
Banner; the vexillum or upper petal in a papilionaceous flower.
Barbs; stiff hooked hairs.
Bark; the external covering of the stem, 75.
Beaked; tipped with a terminal process, like a bird's bill.
Bearded; beset with bristly hairs.
Bell-shaped; companulate, Fig. 89.
Berry; a pulpy valveless fruit, in which the seeds are imbedded.
Bi; in composition, *twice*, as—
Bicarinate; 2 keeled.
Biennials; 2 yearly.
Bifid; 2 cleft.
Bifarious; 2 ranked-
Bifurcate; 2 forked.
Bilabiate; 2 lipped.
Binate; in twos, twin.
Bladdery; thin and inflated.
Blade; the expanded surface of a leaf.
Bloom; a fine powdery coating on certain fruits, &c., as the plum.
Brachiate, pairs of branches, spreading nearly at right angles.
Bracts; floral leaves, 130, Fig. 72.
Bracted, or Bracteate; having bracts.
Branchlets; small branches or subdivisions of branches.
Breathing pores; stomato, 140.
Bristles; stiff hairs, straight or hooked.
Bulb; a subterranean bud, 62.
Bulbous; bulb-bearing, or bulb-like.
Bullate; as if blistered.

Caducous; falling off very early.
Cæspitose; growing in turf or tuft.
Calcarate; spurred.
Calyciform; cup-like.
Calyculate; with an accessary outer calyx.
Calyptra; the cap or hood of the sporangia in mosses.
Calyx; the outer floral envelope, 180.
Cambium; the soft layer between the bark and the wood.
Campanulate; bell-shaped, Fig. 89.
Campylotropous; a curved ovule.
Canescent; becoming white or hoary.
Capillary or Capillaceous; shaped like a slender thread or strong hair.
Capitate; in heads.
Capitulum; a head, Fig. 79..
Capsule; a dry and indehiscent pericarp, usually opening by valves.
Carina; a keel.
Carinate; keeled.
Carpel; a little fruit, usually a partial pistil, or element of a compound pistil.
Carpophore; the central axis supporting the fruit in the umbelliferæ.
Cartalaginous; hard and tough.
Caruncle; a protuberance or appendage at the hilum of a seed.
Caryophylaceous; a flower like the pink, Fig. 96.
Caryopsis; a grain, as wheat, rye, &c.
Catkin; see Ament, Fig. 81.
Caudate; having a tail-like appendage.
Caudex; a stem or trunk.
Caulescent; having a stem.
Cauline; attached to the stem.
Cell; a hollow cavity. The cavity of an ovary or pericarp.
Cellular tissue; a tissue composed of small bladders or vesicles, 7.
Centrifugal Inflorescence; the flowering of a cyme, 160.
Centripetal Inflorescence; the flowering of a corymb, 159.
Cephalous; headed, or head-bearing.
Cernuous; drooping or bending down.
Chaff; the thin covering of the seeds of grasses, &c., or the flower bracts in compound flowers.
Chalaza; the points of union of the coats and nucleus of a seed, 209.
Channelled; hollowed out like a gutter.
Chartaceous; with the texture of writing paper.
Chlorophyll; the colored parenchyma of leaves.
Cilia; hair-shaped appendages.
Ciliate; fringed with hairs on the margin.
Cinereus; ash-gray.
Circinate; coiled or rolled up into a ring.
Circumcissile; cut round, opening transversely.
Circumspection; the general outline.
Cirrhous; having tendrils, 60, Fig. 65.
Clasping; where the base of a leaf partly surrounds a stem.
Class; the highest division of plants in a system.
Clavate; club-shaped, larger at one end.
Claw; the lower narrow end of a petal, by which it is affixed.
Cleft; partially split or divided.
Climbing; ascending by means of tendrils, leaves or aerial roots.
Coadunate; having united bases.
Coarctate; pressed together.
Coccus; a separable carpel of a compound carpel.
Cochleate; coiled spirally, like a snail-shell.
Collateral; side by side.
Colored; any hue but green.
Columella; a solid axis of a pod.
Column; the stamens or stamens and pistils combined.
Coma; a full tuft of hairs.
Commissure; the face by which 2 carpels cohere.
Complete flower; having both floral envelopes.
Complicate; folded up upon itself.

Compound; a whole formed of similar parts.
Compressed; flattened lengthwise.
Conduplicate; folded together so that the sides are applied face to face.
Cone; a collective fruit. See Strobile, Fig. 125.
Confluent; running together.
Conglomerate; clustered into a mass.
Conjugate; in pairs.
Connate; united at base.
Connectile; the prolongation of a filament supporting the lobes of an anther.
Connivent; converging together.
Contorted; twisted.
Convolute; rolled up into a cylinder.
Cordate; heart-shaped, Fig. 34.
Coriaceous; leathery or parchment-like.
Cormophytes; stem growing plants.
Corm; a solid bulb, 64.
Corneous; horn-like in texture.
Corniculate; bearing a small horn.
Cornate; horned.
Corolla; the inner floral envelope.
Coronate; crowned.
Corrugated; wrinkled.
Cortex; the bark, 17.
Cortical; having bark or arising from the bark.
Corymb; an umbel-shaped raceme.
Costate; ribbed.
Cotyledons; seed-leaves.
Creeping; running along the surface, or just under the surface of the ground.
Cremocarp; the seed-like double fruit of Umbelliferæ, Fig. 122.
Crenate; having round notches or teeth. Fig. 59.
Crenulate; finely crenate.
Crested or Cristate; having an appendage like the comb of a cock.
Crown; the pappus or coma on seeds.
Cruciform, in the shape of a cross.
Cryptogamia; flowerless plants, 259.
Cucullate; hooded.
Cucurbitaceous; gourd or melon-like.
Culm; the stem of the grasses.
Cuneate or Cuneaform; wedge-shaped.
Cupule; the cup of an acorn.
Curvinerved; leaf-nerves arising from a prolongation of the petiole, instead of the base, 98.
Cuspidate; with a sharp rigid point.
Cyathiform; cup-shaped, top-shaped and hollow.
Cymbiform; boat-shaped.
Cyme; an umbel-like centrifugal inflorescence.

Decandrous; with ten stamens.
Deciduous; falling off.
Declinate; turned to one side.
Decompound: several times divided.
Decumbent; lying on the ground.
Decurrent; prolonged below the insertion.
Decussate; crossed, in pairs alternately crossing.
Deflected; bent back.
Dehiscence; natural opening of capsules.
Deltoid; having a triangular outline. Fig. 30.
Dentate; toothed. Fig. 57.
Denticulate; with small teeth.
Depressed; flattened from above.
Dextrine; a soluble form of starch.
Di, in composition; two, as—
Diadelphous; having the filaments in two parcels.
Diandrous; having two stamens.
Dichlamydeous; having both calyx and corolla.
Dichotomous; 2-forked.
Diclinous; when the stamens and pistils are in separate flowers.
Dicotyledonous; having two cotyledons. Fig. 126.
Didymous; double or twinned.
Didynamous; 2 long and 2 short stamens.
Diffuse; spreading widely and loosely.
Digitate; finger-shaped. Fig. 44.
Digynous; having 2 pistils.
Dimerous; in twos.
Diœcious; having the stamens on one plant, and the pistils on another.
Dipetalous; of 2 petals.
Diphyllous; of 2 leaves.
Discoid; resembling a disk.
Disk; the whole surface of a leaf, or centre of a compound flower.
Dissected; deeply gashed.
Dissepiment; a partition.
Distichous; in two opposite rows.
Distinct; unconnected.
Divaricate; widely spreading.
Diverging; spreading out.
Divided; severed in two or more parts.
Dodecandrous; with 12 stamens.
Dorsal; borne on the back.
Dorsal suture; outer seam of a carpel.
Downy; having short, soft hairs.
Drupe; a pericarp, with a hard stone covered by a sarcocarp, as the Plum, Cherry, &c. Fig. 120.
Drupaceous; bearing drupes.
Ducts; membraneous vessels or tubes, which do not unroll spirally, 14.
Duplicate; doubly.
Duramen; heart-wood.

E, Ex, in composition; destitute of, as—
Ebracteate; destitute of bracts.
Eared; having lobe-like appendages.
Echinate; beset with rigid prickles.
Elators; spiral threads in the thecæ of Liverworts, 269.
Elliptical; longer than wide, rounded at each end. Fig. 26.
Elongated; longer than usual.
Emarginate; with a notch at the apex. Fig. 63.
Embryo; the future plant, contained in the seed, 238.
Emersed; rising out of the water.
Endocarp; the inner coat of a fruit.
Endogen, Endogenous; inside growers, increasing by internal accretions, 77, Fig. 20.
Endostome; orifice of the outer coat of the nucleus.
Enneandrous; having nine stamens.
Ensiform; sword-shaped.
Entire; even-edged.

Ephemeral; lasting but a day.
Epicarp; the outer skin of a fruit.
Epidermis; cuticle, outer skin, 17.
Epigynous; growing on the apex of the ovary.
Epipetalous; growing on petals.
Epiphytes; plants growing on other plants. Air plants, 42.
Episperm; Testa, outer coat of seed.
Equitant; opposite leaves infolding each other, so as to alternately overlap each other's edges, 88.
Erose; unequally sinuate, as if gnawed.
Etiolated: blanched.
Exalbuminous; seed without albumen.
Exogens; outside growers, increasing by external accretions, 12. Fig. 19.
Exostome; orifice of the inner coat of the nucleus.
Exotic; plants belonging to a foreign country.
Exserted; projecting out beyond the orifice.
Exstipulate; destitute of stipules.
Extrorse; turned outwards.

Falcate; shaped like a scythe or sickle.
Farinaceous; mealy.
Fascicle; a contracted cyme. Fig. 85.
Fasciculated; in bundles or fascicles.
Fastigiate; flat-topped, applied to a cluster.
Favose: honey-combed.
Feather; the plumose crown of seeds.
Feather-veined; with the veins like a feather, 99.
Fertile; applied to pistillate flowers.
Fibre: any thread-like part.
Filament; that part of a stamen that supports the anther.
Filiform; thread-like.
Fimbriate; fringed.
Fissure: a cleft, or split.
Fistulous: hollow like a reed.
Flabelliform: fan-shaped.
Flaccid: lax, or limber.
Flagelliform; whip-like.
Fleshy; thick, and containing a firm pulp.
Flexuous: bent or curved right and left alternately.
Floccose; covered with loose cottony tufts.
Floral; relating to a flower.
Florets; the separate small flowers of a cluster or head.
Floriferous: bearing flowers.
Flower; the stamens and pistils, and their envelopes. 187. Fig. 87.
Foliaceous; leaf-like in texture.
Foliate: with leaves.
Follicle; a one-valved pericarp, dehiscing longitudinally. Fig. 117.
Foramen; the small aperture in the coats of a seed.
Foveolate; pitted.
Fovilla; the fine dust in the pollen grains.
Free; not adherent to any other organ.
Frond; stem and leaf confluent together, peculiar to cryptogamous plants, 264.
Fruit; the seed with its enclosing pericarp.
Frutescent; woody, or becoming woody.
Fugacious; falling away very early.
Funiculus; foot-stalk of the ovary or seed.
Funnel-shaped; a corolla with a tube, and a gradually expanding limb.
Furcate; forked.
Furrowed; marked with longitudinal channels.
Fusiform; spindle-shaped, like the Radish, 32.

Galea; a helmet, the upper lip of a labiate corolla.
Gamopetalous; having one petal.
Gamosepalous; having one sepal.
Geminate; in pairs.
Genera, genus; ideal assemblages of nearly related species.
Geniculate; bent at a very obtuse angle.
Germ; the growing point of a bud.
Germination; the swelling of a seed and the evolution of its embryo.
Gibbous; swollen or enlarged at one side.
Glabrous; smooth.
Gland; a small collection of tissue producing a secretion, 20.
Glandular; furnished with glands.
Glaucous; covered with a whitish, fine powder, or *bloom* that rubs off.
Globose: globular, round like a ball.
Glomerate; densely clustered.
Glomerule; small heads forming a glume.
Glume; the scales or bracts surrounding the stamens and pistils in the grasses.
Gluten; a tenaceous principle found in some seeds.
Granulate; in the form of grains.
Gymnospermous; naked-seeded plants.
Gymnospermia; an order of Didynamia.
Gynœcium; the pistillate system of a flower, 198.
Gynandrous; when stamens are seated on the pistil.
Gynaphore; a special stalk of the ovary.

Habitat; the situation where a plant naturally grows.
Hairs; hair-like appendages to plants, 21.
Halbert-shaped, hastate. Fig. 36.
Hastate; shaped like a halbert.
Head; flowers collected in a rounded form.
Heart-shaped; cordate. Fig. 34.
Heart-wood; duramen, the inner layers of a stem.
Helmet; the upper lip of a labiate flower.
Hemicarp; half a cremocarp.
Heptandrous; having seven stamens.
Heptagynous; having seven styles.
Herb; any plant not having a woody stem.
Herbaceous; not woody.
Herbarium; a collection of dried plants.
Hesperidium; an orange, or similar fruit.
Heterogamous; a compound flower, with

the disk flowers perfect, and the rays ligulate and pistillate, or neutral.
Heterotropous; see amphitropous.
Hexamerous; a whorl of six parts.
Hexandrous; having six stamens.
Hexagynous; having six styles.
Hilum; the scar or mark on a seed, left by the detachment of the funiculus.
Hirsute; clothed with soft hairs.
Hispid; bristly, beset with stiff hairs.
Hoary; whitish from a scaly mealiness.
Homogamous; all the flowers of a head alike.
Homotropous; having the same direction as the body to which it is attached.
Hooded; curved suddenly at the point.
Hybrids; crosses between allied species.
Hypocrateriform; salver-shaped. Fig. 90.
Hypogynous; stamens arising from below the ovary.

Icosandrous; having more than ten stamens inserted on the calyx.
Imbricated; lying over each other with regularity, so as to break joints.
Imperfect; wanting stamen or pistil.
Incised; irregularly and sharply cut.
Incumbent; leaning upon, the radicle resting against the back of one cotyledon.
Incurved; bent inwards.
Indefinite; too numerous to be counted.
Indehiscent; not opening naturally.
Indigenous; being a native.
Induplicate; having the edges bent or rolled inwards.
Indusium; a thin membraneous covering, applied to the scale on the thecæ in ferns.
Inferior; towards the base or root.
Inflated; enlarged, as if dilated by air.
Inflexed; incurved.
Inflorescence; the mode in which flowers are arranged on a branch.
Infracted; bent at so acute an angle as to appear broken.
Infundibuliform; funnel-shaped. Fig. 90.
Innate; when an anther is firmly attached to the apex of a filament.
Insertion; the point of attachment or union.
Interfoliaceous; between the insertion of leaves.
Internode; the space between nodes or joints.
Interrupted; when organs of a different size are interposed in a series.
Interval; the channel on a cremocarp between the ridges.
Introduced; not originally a native.
Introrse; turned outward.
Inverted; when a part is in an opposite direction to other similar parts.
Involucel; a partial involucre.
Involucre; a whorl of bracts to an umbel or head.
Isomerous; equal in the number of parts.

Jointed; separating across by an articulation.
Juga; pairs.

Keel; the lower petal of a papilionaceous corolla.
Keeled; furnished with a projecting ridge along the under side, like the keel of a boat.
Kidney-shaped; reniform, much hollowed at one side, and rounded at the ends. Fig. 38.
Knot; a node or swelling joint.

Labellum; the lip-formed petal in orchidous flowers.
Labiate; having lips. Fig. 93.
Lacerated; torn, cut into irregular segments.
Laciniate; slashed, deeply and irregularly cut.
Lactescent; milky.
Lamella; a thin plate.
Lamina; a broad plate or expansion.
Lanate, Lanaginous; woolly.
Lanceolate; shaped like the head of a spear. Fig. 24.
Latex; the proper juices of plants.
Lactiferous tissue; the series of vessels carrying the latex, 16.
Lateral; at the side.
Leaflet; one of the small leaves of a compound leaf.
Leafstalk; petiole.
Legume; a pod, a two-valved pericarp. Fig. 118.
Lenticular; resembling a double convex lens.
Liber; the innermost layer of bark.
Lignin; a vegetable principle found in woody fibre.
Ligule; an appendage shaped like a strap.
Ligulate; strap-shaped, long and narrow.
Liliaceous; having a corolla like a lily. Fig. 97.
Limb; the spreading part of a petal of a monopetalous corolla.
Line; the twelfth part of an inch.
Linear; narrow and long.
Lineate; marked with lines.
Lips; the pieces of a 2-labiate (2-lipped) corolla.
Lobes. Lobed; rounded divisions.
Loculicidal; the dehiscence of the component carpels of a compound fruit, by the dorsal suture. Fig. 112.
Loment; a jointed legume.
Lunate; crescent-shaped.
Lurid; of a dull, deathly hue.
Lyrate; pinnatifid, having the upper segments largest. Fig. 40.

Mammilar; conical, with a rounded apex.
Marescent; withering—persistent.
Margin; the circumference or edge.
Mealy; covered with a white powder.
Medullary rays; the *silver-grain* of wood.
Membranous, or Membranaceous; the texture or thinness of membrane.

Mericarp; half a cremocarp, a fruit of an umbelliferous plant.
Micropyle; foramen or scar of an ovule.
Midrib; the main rib of a leaf, extending from the base to the apex.
Mitriform; having two terminal divisions, like a mitre.
Monadelphous; stamens united in one set.
Monandrous; having one stamen.
Moniliform; necklace-shaped.
Monocarpous; bearing but one fruit, or bearing but once.
Monochlamydeous; when the calyx only is present.
Monoclinous; having the stamens and pistils in the same flower.
Monocotyledonous; having but one cotyledon.
Monœcious: having stamens and pistils in different flowers, but on the same plant.
Monogynous; having but one style.
Monopetalous; where the corolla is of one piece.
Monophyllous; one-leafed.
Monosepalous; calyx in one piece.
Monospermous: one-seeded.
Mucronate: having a rounded end.
Multifid; many-cleft.
Multipartite; many-parted.
Multiple; a number containing another number several times without a remainder: as 9 is a multiple of 3.
Muricate; having short rigid excrescences.
Muticous or Mutic: pointless, awnless.
Mutilated; not produced in a perfect form.

Naked; wanting a covering analogous to that of other species.
Napiform; turnip-shaped.
Natant; swimming, floating.
Navicular; boat-shaped.
Neck; the crown of a root; the upper part of the tube of a corolla.
Necteriferous: bearing honey.
Nectary; the part of a flower secreting honey.
Needle-shaped; linear, rigid, tapering to a point.
Nerved; having rib-like fibres.
Nerves; parallel veins or rib-like fibres extending from above the base to the apex.
Netted; having reticulated fibres.
Neuter or Neutral; having neither stamens nor pistils.
Node; a knot or joint, the projection from which leaves arise.
Nodding; inclining to one side, partly drooping.
Nodi; nodes, knots joints.
Nodose; having many nodi or joints.
Normal; regular in structure.
Nucamentaceus; producing nuts.
Nucleus; kernel, the subtance of a seed or ovule.
Nucules; little nuts, or nut-like fruits.
Nut; a one-celled, and one-seeded fruit, arising from a two or more-celled and seeded ovule.
Nutant; nodding, partially drooping.

Ob; a particle, which. when prefixed to any other term. denotes the inversion of the usual position.
Obconic; conic, with the apex downward.
Obcordate; reversed heart-shaped.
Oblanceolate; with the widest part above the middle, and tapering gradually to the base.
Oblique; not symmetrical, one side as it were cut off obliquely.
Oblong; much longer than broad.
Obovate; ovate, with the narrowest portion at base.
Obovoid; inversely ovoid.
Obsolete; when a part is obscure, and as if worn away.
Obtuse; blunt, rounded.
Obsolute; where one margin of a leaf in the bud is exterior, the other interior.
Ochrea: a cylindrical stipule.
Ochroleucous; whitish-yellow, cream-color.
Octandrous; having eight stamens.
Octogynous; having eight styles.
Offset; a lateral branch. terminated by a cluster of leaves, and capable of taking root.
Oleaginous; oily, affording oil.
Opercular; opening by a lid fixed at one side.
Operculum; the lid or covering of the theca in mosses.
Opposite; standing directly against each other on opposite sides of the stem.
Orbicular; having a circular outline.
Orthotropous; where an ovule is turned from its original direction.
Oval; longer than broad, the sides curving regularly from end to end.
Ovary; the germ or base of the pistil; the young state of a pericarp.
Ovate; egg-shaped.
Ovoid; having the outline of an entire egg.
Ovule; the incipient form of a seed, contained in an ovary.

Palate; a large obtuse projection which closes the throat of a personate flower.
Paleæ; a chaffy bract to a floret in some compound flowers.
Paleaceous; chaffy.
Palmate; divided so as to resemble the hand and fingers.
Panduriform; fiddle-shaped.
Panicle; an irregularly-branched raceme.
Panicled or Paniculate; arranged in the form of a panicle.
Papilionaceous; butterfly-shaped; a form of an irregular polypetalous corolla.
Papillose; pimpled, having fleshy protuberances.
Pappus; the seed-down in compound flowers.

Parasitic; drawing support from another plant.
Parenchyma; common cellular tissue in a soft state.
Parietal; arising from the inner wall of an organ.
Parted; divided almost to the base.
Partial; particular, not general.
Partition; a dissepiment.
Pectinate; divided like the teeth of a comb.
Pedate; finely palmate, like the foot of a bird.
Pedicel; a partial or secondary flower-stalk.
Pedicillate or pedicelled; having or being supported on a pedicel.
Peduncle; a flower-stalk.
Peduncled or pedunculate; having a peduncle.
Pellicle; a very thin stratum or coat.
Pellucid; transparent, pervious to light.
Pellucid-punctate; having punctures admitting the passage of light.
Peltate; shield-like, having a stalk or support in the water.
Pencilled or pencillate; ending like a painters pencil or brush.
Pendulous; hanging down.
Pentagonal; having five corners or angles.
Pentagynous; having five styles.
Pentandrous; having five stamens.
Pentamerous; a whorl of five parts.
Pepo; an indehiscent fleshy, or internally pulpy fruit, formed of three united carpels.
Perennial; lasting from year to year.
Perfoliate; where a stem perforates a leaf.
Perforate; having holes and dots, as if pricked.
Perianth; floral envelopes.
Pericarp; the fruit seed case.
Peridium; a spore-case.
Perigonium; a perianth.
Perigynium; a sac enclosing the ovary.
Perigynous; inserted around the ovary.
Perisperm; the albumen.
Peristome; the fringed border of the theca in mosses.
Permanent, persistent; remaining for a long time.
Personate; masked; a form for a labiate flower.
Petal; the colored leaf of a flower.
Petaloid; resembling a petal.
Petiole; the foot-stalk of a leaf.
Petioled or petiolate; with a petiole, not sessile.
Petiolule; the foot-stalk of a leaflet.
Phanogamous or phanerogamous; having visible stamens and pistils.
Phyllodium; a leaf formed of a dilated petiole.
Pilose; hairy, having slender hairs.
Pinnal; the leaflets or divisions of a pinnate leaf.
Pinnate; a leaf is pinnate when the leaflets are arranged in two rows on the side of a common petiole; winged.
Pinnatifid; cut-winged, where the lamina on each side of a petiole is deeply cleft.
Pinnules; the leaflets or subdivisions of a bi-tri or multi-pinnate leaf.
Pisiform; formed like peas.
Pistil; the central organ of flowers composed of style, stigma and ovary.
Pistillate; having pistils only.
Pith; the central spongy substance in the centre of plants, composed of cellular tissue.
Placentæ; the line or body to which the ovules are attached.
Plaited; folded in regular layers.
Plane; flat.
Plicate; folded like a fan.
Plumose; resembling a feather, fringed with hairs.
Plumule; the incipient ascending axis.
Poculiform; cup-shaped.
Pod; a pericarp of two valves; it may be a Legume or Silique.
Podosperm; funiculus, footstalk of an ovary.
Pollen; the granules or dust contained in anthers.
Pollen-tube; a minute tube projected from a pollen grain.
Pollinia; masses of pollen.
Polydelphous; having stamens united in more than two sets.
Polyandrous; having many stamens attached to receptacle.
Polygamo-diœcious; having perfect and imperfect flowers on distinct plants.
Polygamous; having perfect or staminate and pistillate flowers, or all these kinds.
Polygynous; having many styles.
Polymorphous; changeable, assuming a variety of forms.
Polypetalous; having many petals.
Polyphyllous; having many leaves, applied to the calyx.
Polysepalous; having many sepals.
Polyspermous; having many seeds.
Pome; a pulpy or juicy fruit, formed of a juicy or fleshy calyx; enclosing the carpels.
Porrected; extended forward.
Præfoliation; vernation, the arrangement of a leaf in a bud.
Præfloration; æstivation, the arrangement of the floral envelopes in a bud.
Præmorse; as if bitten off.
Prickle; a sharp appendage of the bark, not connected with the wood.
Primine; outer coat of ovule.
Prismatic; having several parallel flat sides.
Process; a protuberance or projecting part.
Procumbent; lying on the ground.
Proliferous; where leaves or flowers arise from others.
Prostrate; lying on the ground.
Protruded; projecting out, exserted.
Pruinose; coverered with a frost-like meal.
Pseudopinnate; falsely a imperfectly pin-

nate, not resolving at any time into seperate leaflets, as the the Pea, Vetch.
Puberulent; covered with a minute pubescence.
Pubescence; a general term for the hairy covering of plants.
Pubescent; hairy, having hairs of any kind.
Pulp; the soft, juicy, cellular substance found in berries and similar fruits.
Pulverulent; powdery.
Pulvinate; cushion-like.
Punctate; dotted.
Puncticulate; having minute dots.
Pungent; sharp-pointed, or prickly at the apex, acrid.
Putamen; a nut-shell.
Pyramidal; tapering upwards.
Pyriform; pear-shaped.
Pyridium; a capsule with a transverse dehiscence.

Quadrangular; four-cornered.
Quadrifarious; in four rows or directions, pointing or facing four ways.
Quadrifid: four-cleft.
Quaternate; four together.
Quinate; arranged in fives.

Raceme; an inflorescence having the flowers supported on pedicels along a rachis.
Racemose: flowering in racemes.
Rachis; the axis of inflorescence; or the general petiole in pinnate leaves.
Radiant or Radiate; diverging from a common centre, furnished with rays.
Radical; proceeding directly from the root.
Radicle; secondary roots, rootlets.
Radicating; sending out roots at the nodes or joints of the stem.
Rameal; belonging to the branches.
Ramenta; the scales or persistent remains of leaves or other parts of the plant.
Ramentaceous; covered with ramenta.
Ramose: branched, branching.
Raphe; the ridge or part connecting the hilum and chalaza.
Raphides; minute crystals in the cellular tissue.
Ray; the outer florets of a compound flower.
Receptacle; the base on which the parts of fructification are seated.
Reclined or reclinate; inclined downwards.
Recurved; bent downwards.
Reduplicate; with the edges folded or turned outwards.
Reflexed; bent backwards.
Regular; having the parts equal and uniform; as the divisions of the calyx or corolla.
Remote; distant.
Reniform; kidney-shaped.
Repand: spread, having a curved or sinuous margin.
Replicate; bent back on itself.
Replum; a persistent placentæ, or margin in certain seeds.
Resupinate; inverted.
Reticulate; netted.
Retroflex: bending in various directions.
Retrorse or retrorsely; turned backwards.
Retuse; when an apex is slightly indented or hollowed out.
Reversed; bent back towards the base.
Revolute; rolled backwards.
Rhizoma; a horizontal subterranean stem.
Rhomboidal; oval, but somewhat angular at the middle.
Rhomboid; when the midrib of a leaf sends off marked lateral ones.
Ribs; parallel ridges or nerves extending from near the base to the apex.
Rigid; stiff, inflexible.
Rimose; full of chinks or clefts.
Ringent; grinning; applied to a form of labiate flowers.
Root; the descending axis of a plant.
Rooting; sending out lateral roots.
Rootlet; a secondary root or fibre.
Rosaceous; having a corolla like a rose.
Rostrate; beaked.
Rostellate; with a small beak.
Rosulate; arranged in the form of a rosette.
Rotate; wheel-shaped.
Rugged or Rough; covered with small asperities.
Rudiment; a term applied to an organ that is imperfectly developed.
Rufescent; becoming reddish-orange or rusty.
Rufous; reddish-brown or rust-colored.
Rugose; wrinkled, having small folds or elevations.
Rugolose; finely wrinkled.
Ruminated; when the albumen has a wrinkled or folded appearance.
Runcinate: pinnatifid, with the divisions pointing backwards.
Runner; a shoot producing leaves and roots at the end,

Saccate; having or resembling a small sac.
Sagittate; arrow-headed.
Salver-shaped; a monopetalous corolla, with a flat spreading limb.
Samara; an indehiscent, winged pericarp.
Sap; the watery fluid absorbed by the spongioles of a plant, and affording it nourishment.
Sapwood; albumen, the outer layer.
Sarcocarp: the fleshy or pulpy coat of a pericarp, between the epicarp and exocarp.
Sarmentose; a running shoot, rooting at its joints.
Scabrous: rough.
Scales; thin membraneous processes, attached to the cuticle, &c.
Scandant; climbing usually by tendrils.
Scape; a radical peduncle, or flower stem.
Scarious; dry and membraneous.

Scattered; irregularly and thinly arranged.
Scions; lateral shoots or offsets from the root.
Scorpoid: an unilateral raceme, which is revolute before expansion.
Scrobiculate; pitted.
Scutellate; shaped like a target or shield.
Secund; turned to one side. one-sided.
Secundine; the second coat of the ovule.
Seed; the matured result of fecundation, and designed to reproduce the species.
Segments; the parts into which a corolla. calyx, &c., are divided.
Semi; half.
Semi-bivalved; half divided into two valves.
Sepaloid; like sepals, not petal-like.
Sepals; the leaves of a calyx.
Septicidal; when a pericarp opens by the opening of the ventral sutures, and a division of the dissepiments.
Septiferous; bearing a septum.
Septifragal; when the dissepiments remain attached to the axis, separated from the valves, as in the loculicidal dehiscence.
Septum; a partition.
Sericeous; silky, covered with soft short hairs.
Serrate; having teeth like those of a saw.
Serrulate; when serrate teeth are again serrated, it also means finely serrate.
Sessile; where any organ is destitute of a stalk or support.
Seta; a bristle.
Setaceous: bristle-like.
Setiform; formed like a bristle.
Setose; bristly, having bristles or stiff hairs.
Sheaths; the prolongation of a leaf, bract, &c., down a stem, so as to enclose it.
Sheathed; embraced by a sheath.
Sheathing; surrounding by a convolute base.
Shield-shaped; shaped like an ancient shield.
Shining; glossy, smooth and polished.
Shrub; a small plant with a woody stem.
Sickle-formed; much curved, with sharp edges.
Silicle; the pod of a plant of the order siliculosa.
Siliculosa; an order of Tetradynamia having pods almost as broad as long.
Silique; the pod of a plant of the order siliquosa
Siliquosa; an order of Tetradynamia, having the pods much longer than broad.
Silky; clothed with soft and shining appressed hairs.
Simple; undivided.
Sinuate; having rounded shallow incisions.
Sinus; a rounded incision in the margin.
Smooth; having an even surface.
Solitary; single.
Sorus; a cluster of sporangia in ferns.
Spadix; an elongated spike, covered by a spathe or modified bract.
Span (measure); 9 inches.
Sparse; scattered.
Spathe; a kind of sheathing bract, to spadix or single flower.
Spatulate: shaped like a spatula.
Species: the lowest division of plants.
Spermoderm; testa, outer coat of seed.
Spike; flowers arranged on an elongated rachis, with very short, or no pedicels.
Spikelet: a division of a spike.
Spindle-shaped; fusiform.
Spine; a thorn, connected with the wood.
Spinose; bearing spines.
Spiral vessels: membraneous tubes, having internally a spiral fibre or fibres.
Spongioles; the extremities of root fibres.
Sporangium; the case containing spores.
Spores; sporules; the organs serving as seeds in Cryptogamous plants.
Sporidia; membraneous cases containing spores in the Fungi.
Sporogens; parasitic plants, having flowers, but propagated by spores.
Spur; a process from the calyx or corolla resembling a cock's spur.
Squamose: scaly.
Squamellate; bearing small narrow scales.
Squarrose: ragged. scales or leaves standing out from a common axis.
Stamens; the fecundating organs of plants.
Staminate; having stamens only.
Standard; banner, the upper petal of a papillionaceous flower.
Stellate; star-like, spreading out in a radiate manner.
Stem; the ascending axis of a plant.
Stemless; unprovided with a stem.
Sterile: a staminate flower.
Stigma; the terminating organ on a pistil.
Stipe; the stalk of a fern, fungus, or of a pod.
Stipellate; having stipelles.
Stipelles; a stipule of a leaflet.
Stipitate; having a stipe.
Stipulate; furnished with stipules.
Stipule; a leafy appendage or leaflet, at or near the insertion of the petiole.
Stolon; a rooting branch or shoot.
Stomato; pores in the epidermis.
Striate; streaked with longitudinal lines.
Strigose; clothed with short, rigid, appressed hairs.
Strobile; a cone, a kind of ament with woody scales, each of which is an open carpel.
Strophiole; an appendage at the hilum of some seeds.
Struma; a cushion-like swelling, a protuberance at the base of the carpel of some Mosses.
Style; that part of a pistil between the ovary and stigma; it is often absent.
Stylopodium; the thickened base of some styles.

Suberose; cork-like.
Sub-, a qualifying prefix, signifying somewhat; as
Sub-cordate, somewhat heart-shaped; *sub*-rotund, somewhat round.
Submersed; under water.
Subterraneous; growing beneath the earth.
Subulate; awl-shaped, tapering to a sharp point.
Succulent; juicy, pulpy.
Sucker; a shoot.
Suffruticose; slightly shrubby; smaller than a shrub.
Sulcate; grooved, marked with deep lines.
Superior: a calyx or corolla is superior when it is inserted on the upper part of an ovary.
Supra-axillary: appearing above an axil.
Surculose; producing suckers.
Suspended; an ovule hanging directly downwards.
Sutural; belonging to a carpel.
Suture; a seam at the meeting of two parts, the line of dehiscence of a carpel.
Symmetrical; when parts are in their normal proportions.
Syncarpous; several carpels uniting in one ovary.
Syngenesious; anthers united in a tube.
Synonymes; names of the same meaning.

Tail; a filiform process affixed to a seed.
Tap-root: a conical root.
Tegmen: the inner covering of a seed.
Tendril: an appendage by which a climbing plant supports itself.
Terete; cylindrical or tapering, but round.
Terminal; proceeding from the apex.
Ternate; in threes, threefold.
Testa; the outer coat of a seed.
Tetradynamous; having 6 stamens, 4 of which are longer than the others.
Tetragynous: having 4 styles.
Tetramerous; in fours.
Tetrandria; having 4 stamens.
Thalamus; a name for the receptacle of the flowers.
Thallophytes: stemless, leafless, flowerless plants.
Thallus; the frond of Hepaticæ.
Theca; a spore-case.
Thorn: a spine or short process from the woody part of a plant.
Throat: the orifice of a calyx tube.
Thyrsus; a condensed panicle.
Tomentose; woolly with short dense hairs.
Toothed: having salient points not directed towards the apex of the leaf.
Top-shaped; inversely conical.
Tortuous; irregularly bent or twisted.
Torus; a receptacle.
Transverse; crosswise.
Tree; a large woody plant.
Triadelphous; having stamens in three sets.
Triandrous; having three stamens.
Tribracteate; with three bracts.
Trichotomous; three-forked.

Tridentate: three-toothed.
Trifid: three-cleft.
Trifoliate; three leaves together.
Trifoliolate; three-leaflets together.
Trigonous; 3-angled, 3-sided.
Trigynous; having three styles.
Trimerous; a whorl of 3 parts.
Triquetrous; sharply 3-angled, the 3 sides concave.
Tripinnate; 3 times pinnate.
Triternate; 3 times ternate.
Trophosperm; a synonyme for the placenta.
Trumpet-shaped; tubular, dilated at the apex.
Truncate: as if cut off transversely.
Tube; the united part of a calyx or corolla.
Tuber; a thick and fleshy subterraneous stem of no regular form.
Tubercles; small knobs or tubers.
Tuberculate; warty.
Tunicated; coated.
Turbinate: top-shaped.
Turgid; swollen, thick.
Twining; ascending spirally.
Two ranked; rows on opposite sides.

Umbel; an inflorescence, where the flower-stalks diverge from the same point in a radiated manner.
Umbellate; bearing umbels.
Umbellets; secondary or partial umbels.
Umbilicate; depressed in the centre.
Umbilicus, the hilum of a seed.
Umbonate; bossed.
Unarmed; destitute of spines, prickles, &c.
Uncinate; hooked.
Under-shrubs, small plants with woody stems.
Undulate; wavy.
Unguiculate: claw-like; having a claw.
Unguis; the claw of a petal.
Unilateral; one-sided.
Urceolate; urn-shaped.
Utricle: a small bag or sac, a caryopsis which does not adhere to the seed.

Vagina; a sheath.
Vaginate; sheathed.
Valvate: having valves.
Valves; the pieces of a pericarp, which seperate naturally on ripening.
Variety; a plant differing from the type of the species in minor particulars.
Vascular plants; plants with spiral vessels.
Vascular tissue.
Vaulted; arched, as the upper lip in some labiate flowers.
Veins; the ribs of leaves.
Velutinous: velvety, clothed with a close, soft, and dense pubescence.
Velvety: as velutinous.
Venation; distribution of veins in a leaf.
Venose; veiny.
Ventral suture; the suture opening to the axis of the flower.
Ventricose; inflated; swelling out.

Vernation; the arrangement of leaves in the bud.

Verucose; warty.

Versatile; lying horizontally.

Vertical; at right angles with the earth.

Verticel; a whorl.

Verticellaster; a whorled cyme.

Verticellate; in whorls, bearing whorls.

Vescicular; bladdery, having bladder-like cavities.

Vexillum; the standard of a papillinaceous corolla.

Villous or Villose; clothed with long and soft shaggy hairs.

Virgate; wand-like.

Viscid; clammy, glutinous.

Vittæ; oil-tubes, longitudinal canals in the substance of the fruit of Umbelliferous plants, containing aromatic oil.

Voluble; twining.

Wand; a small twig, a long rod.

Wedge-shaped; obovate with straitish sides.

Wheel-shaped; when a corolla has a spreading limb and a very short tube.

Whorl; flowers or leaves surrounding the stem in numbers.

Wings; lateral appendages to leaves, &c., also the two side petals in a papillionaceous flower.

Wood; the solid part of plants, composed of cellular tissue, woody fibre, spiral vessels, &c.

Woody tissue; cells with firm and thickish walls, drawn out into tapering or slender tubes.

Woolly; clothed with long matted hairs.

ANALYTICAL TABLES:

BEING A

Synopsis of the Genera described in this work, according to the Linnæan Artificial System.

WITH REFERENCES TO THE NATURAL ORDERS AND PAGE.

CLASS I. MONANDRIA.—1 *Stamen.*

ORDER I. MONOGYNIA.—1 *Pistil.*

** Flowers not glumaceous.*

	PAGE.
HIPPURIS.—Perianth adherent to the ovary, the border entire. Stamen inserted on the edge of the calyx.—*Aquatics with entire leaves in whorls, and minute flowers.*	118
CANNA.—Perianth unequal, scarcely lip-shaped. Stamens petaloid, only one with half an anther on its edge.—*Herbaceous tropical plants with transverse parallel veined leaves and showy flowers.*	364

** * Flowers glumaceous* (Sedges).

HEMICARPHA.—Perianth none. Style 2-cleft.—*Low tufted annuals with bristle-like leaves at the base, and many-flowered spikes.*	397
Species of *Cyperus, Eriophorus, and Fimbristylis. Cyperaceæ.*	395

ORDER II. DIGYNIA.—2 *Styles or sessile stigmas.*

** Flowers not glumaceous.*

CALLITRICHE.—Filaments slender. Styles 2, awl-shaped. Fruit 4-lobed, 4-celled, naked.—*Leaves opposite, entire.*	314
BLITUM.—Calyx 3 to 5-parted, becoming juicy and berry-like in fruit.—*Leaves triangular or halbert-shaped, sinuate-toothed.*	299

** * Flowers glumaceous* (Grasses).

CINNA.—Spikelets 1-flowered, in a large compound terminal panicle. Stamen opposite the 1-nerved upper paleæ.	417
UNIOLA.—Spikelets several-flowered, very flat, coriaceous.—*Tufted from creeping rootstocks.*	421
ANDROPOGON.—Spikelets 1½-flowered, in pairs. Panicles silky.	431

PAGE.

CLASS II. DIANDRIA.—2 *Stamens.*

ORDER I. MONOGYNIA.—1 *Style or Stigma.*

* *Flowers with only a calyx; not glumaceous.*

FRAXINUS.—Calyx small, 4-cleft. Fruit a samara or key.—*Leaves pinnate.* 295

** *Flowers with a calyx and corolla.*

* *Corolla polypetalous* (of seperate petals).

CHIONANTHUS.—Petals 4, long and linear. Stamens very short. Style very short, with a notched stigma.—*Shrubs with white flowers in drooping racemes.* 295

CIRCÆA.—Petals 2, inversely heart-shaped. Stamens slender.—*Herbs. Leaves opposite. Flowers whitish in racemes.* 116

** *Corolla* monopetalous (one-petalled), regular.

LIGUSTRIM.—Calyx 4-toothed. Corolla 4-lobed, funnel-form. Stamens on the tube of the corolla. Style very short, with a 2-cleft stigma.—*Shrubs with simple entire leaves and small white flowers in thyrsoid panicles.* 294

SYRINGA.—Corolla salver form, with the limb cleft into 4 deep obtuse spreading segments. Stamens short, included within the tube. Capsule 2-celled —*Oriental shrubs with simple entire leaves; and white, lilac, or purplish fragrant flowers.* 295

JASMINUM.—Calyx tubular 5 to 10-cleft. Corolla salver-form, with a long tube and a flat 5 to 10-cleft limb.—*Bushy or climbing shrubs, with opposite compound leaves and white or yellow flowers.* 294

*** *Corolla* 1-petalled, 2-lipped or irregular.

† *Stamens inserted on the tube of the corolla.*

VERONICA.—Calyx 4-parted. Corolla wheel-shaped, with a 4-cleft spreading border. the 2 lower segments mostly narrow. Capsule obcordate or obtuse.—*Herbs with blue flesh color or white flowers.* 243

LEPTANDRA.—Calyx 5-parted. Corolla tubular bell-shaped, with a 4-lobed border. Stamens and pistils at length much exserted.—*Herbs with mostly whorled leaves and white flowers in terminal racemes.* 243

GRATIOLA.—Calyx 5-parted. Stamens included. Style dilated or 2 lipped at the apex.—*Low herbs with opposite sessile leaves, and axillary 1-flowered peduncles.* 240

ILYSANTHUS.—Calyx 5-parted. Upper lip of the corolla short, 2-lobed. Sterile stamens 2, inserted on the throat and protruded.—*Small smooth herbs.* 241

HEMIANTHUS.—Calyx 4-toothed, equal. Corolla 2-lipped, the upper lip very short. Style short. Capsule globular, 1 celled.—*A small annual, with crowded opposite leaves and minute flowers in their axils.* 241

DIANTHERA.—Calyx 5-parted. Corolla deeply 2-lipped. Anthers 2-celled, the cells placed one lower down than the other.—*Herbs growing in water, with narrow entire leaves, and purplish flowers.* 234

†† *Stamens inserted on the corolla or at its base.*

CATALPA.—Calyx deeply 2-lipped. Corrolla bell-shaped, swelling, with an irregular 5-cleft border. Sterile filaments 2 or 3.—*Trees with large heart-shaped leaves, and white flowers in terminal panicles.* 233

UTRICULARIA.—Calyx 2-parted. Corolla personate, the palate on the lower lip projecting. Stigmas bilabiate. Capsule globular, 1-celled.—*Immersed aquatics, with dissected leaves, and erect scapes, bearing yellow or purplish flowers.* 230

**** *Corolla* more or less 2-lipped. *Stamens* inserted on the tube of the corolla.

Style 2-lobed at the apex. *Fruit* 4 little seed-like nutlets, surrounding the style in the bottom of the calyx. See Class 14. Didynamia.

* * * *Flowers glumaceous* (Sedges).

PAGE.

CYPERACEÆ. Species of *Cyperus, Fimbristylus, Rhyncospora, and Scleria.* 395

ORDER II. DIGYNIA.—2 *Styles or sessile Stigmas.*

* *Flowers not glumaceous.*

BLITUM.—Petals none. Calyx berry-like or fleshy. 299

ANYCHIA—Petals none. Calyx of 5 sepals. Seed 1. 54

ELATINE.—Petals and sepals 2 or 3. Seeds several. 46

* * *Flowers glumaceous* (Grasses).

ANTHOXANTHUM.—Lateral flowers each of 1 awned paleæ, neutral; the perfect one 2-androus.—*Panicle contracted or spike-like.* 427

GRAMINEÆ. Species of *Leersia, Brachyelytrum, and Glyceria.* 408

ORDER III. TRIGYNIA.—3 *Styles or sessile stigmas.*

SPERGULARIA.—Sepals 5. Petals 5. entire. Capsule 1-celled, many-seeded.—*Leaves fleshy. Flowers small, reddish.* 55

CLASS III. TRIANDRIA.—3 *Stamens.*

ORDER I. MONOGYNIA.—1 *style or sessile stigma.*

* *Corolla 5-lobed or parted. Leaves reticulate-veined.*

FEDIA.—Border of the calyx 3 to 6-toothed and persistent or obsolete. Corolla tubular, 5-lobed, regular.—*Stems forking. Leaves opposite. Flowers small, whitish.* 154

* * *Perianth 6-parted. Leaves parallel-veined.*

* *Flowers* issuing from a spathe.

IRIS.—Divisions of the perianth alternately reflexed. Stamens under the 3 large petal-like stigmas.—*Flowers large, blue, white and yellow.* 368

SISYRINCHIUM.—Divisions of the perianth equal, spreading. Stamens monodelphous. Style short, with 3 stigmas.—*Leaves grassy. Flowers mostly blue.* 369

PARDANTHUS.—Perianth regular, 6-parted. Filaments thread-like. Stigma straight or incurved.—*Flowers yellowish, spotted with red.* 370

CROCUS.—Spathe radical. Perianth funnel-form. Stigma 3-cleft, convolute, crested.—*Bulbous exotics, with white, yellow, blue and purplish flowers.* 370

TIGRIDIA.—Perianth lobes oblong, upright-spreading, the alternate ones the broadest. Stamens monodelphous: filaments united into a long tube. Style filiform.—*Bulbous exotics with yellow and red spotted flowers.* 370

HETERANTHERA.—Perianth salver-form, with a slender tube. Stamens dissimilar.—*Creeping or floating herbs, with kidney-shaped leaves, and blue or white flowers.* 391

SCHOLLERA.—Perianth salver-form. Stamens similar, with arrow-shaped anthers.—*A water plant with linear leaves, and yellow flowers.* 392

* * *Flowers* not spatheceous.

COMMELYNA.—Calyx and corolla, separate, irregular. Stamens sometimes 6. Stigma single.—*Flowere blue or white.* 392

PAGE.

Xyris.—Calyx and corolla separate, irreguler. Stigmas 3.—*Flowers yellow, in a terminal dense head.* 394

Juncus.—Perianth 6-parted, entirely glumaceous, regular. 389

† NATURAL ORDER CYPERACEÆ.—Proper perianth none, or bristle-like; the 3 stamens and single style invested in an imbricated perianth of glumes instead of a calyx. Fruit 1-seeded.—*Leaves parallel-veined.* 395

ORDER II. DIGYNIA.—2 *Pistils.*

Anychia.—Calyx 5-parted, greenish. Styles very short. Utricle 1-seeded.—*Flowers small, white.* 54

† NATURAL ORDER GRAMINEÆ.—Grasses with usually hollow stems, closed at the joints, and alternate 2-ranked parallel veined leaves.—*Stigmas feathery or hairy.* 408

ORDER III. TRIGYNIA.—3 *Pistils.*

Stellaria.—Calyx 5-parted. Petals 5, 2-parted. Capsule 1 celled. 51

Mollugo.—Calyx 6-parted. Petals none. Capsule 3-celled, 3-valved, many-seeded. 53

Lechia.—Calyx 3-sepaled, with 2 outer bracts or sepals. Petals 3 inconspicuous. Styles scarcely any. Stigmas 3.—*Flowers inconspicuous, greenish or purplish.* 41

Prospinaca.—Calyx-tube 3 sided, with a 3-parted limb. Fruit long 3-angled. 3-celled, 3 seeded, nut-like.—*Aquatic herbs.* 117

CLASS IV. TETRANDRIA.—4 *Stamens, equal in length.*

ORDER I. MONOGYNIA.—1 *Pistil.*

* *Corolla 4-petalled. Leaves reticulate-veined.*

Cornus.—Calyx-limb minute, 4-toothed, adherent to the ovary. Petals oblong spreading. Drupe 2 celled, 2-seeded.—*Shrubs or herbs, with white flowers.* 144

Ludwigia.—Calyx 4-lobed. Petals 4, equal, obcordate, often small or wanting. Capsule 4-celled, many-seeded.—*Flowers often yellow, or apetalous.* 115

* * *Corolla 1-petalled; 4-parted or lobed. Leaves reticulate.*

† *Calyx* free from the ovary.

Bartonia.—Calyx 4 parted. Corolla deeply 4-cleft, not gland-bearing. Stamens short. Capsule 1-celled, many seeded.—*Leaves scale-like. Flowers small yellowish-white.* 287

Obolaria.—Calyx of 2 spreading leaf-like sepals. Corolla tubular-bell-shaped, 4-cleft. Stigma 2 lipped.—*Plant purplish green. Flowers whitish or purplish.* 289

Plantago.—Calyx 4 (rarely 3)-parted. Corolla tubular, 4-cleft, with a reflexed border. Stamens mostly very long. Capsule 2-celled, opening transversely.—*Leaves radical, ribbed. Flowers whitish, in a bracted spike.* 224

Erythræa.—Calyx 4 or 5-parted. Corolla funnel-form, with a slender tube and 4 or 5-parted limb.—*Leaves opposite. Flowers rose purple or reddish, cymose.* 286

† † *Calyx* adherent to the ovary or its base.

Hedyotis.—Calyx 4-lobed, persistent. Corolla funnel-form, salver-form, or wheel-shaped, the limb 4 parted. Stigmas 2.—*Flowers blue or purplish, single or clustered.* 153

PAGE.

Mitchella.—Flowers united in pairs. Calyx 4-toothed. Corolla funnel-form, 4-parted, spreading, bearded inside. Ovaries united.—*Trailing herbs. Flowers rose-colored or whitish. Berries red, edible.* 152

Cephalanthus.—Calyx small, 4-cleft. Corolla tubular, slender, 4-toothed. Style much exserted; stigma capitate.—*Shrubs with opposite leaves, and white flowers in a dense globose head.* 152

Dipsacus.—Corolla tubular, 4-cleft, nearly regular. Stamens inserted on the corolla. Fruit 1-seeded, crowned with the calyx.—*Coarse herbs, with opposite connate leaves, and bluish or whitish flowers in large oblong heads.* 155

*** *Corolla 4 or 5-parted, or none. Calyx 4 or 5-parted.*

Scabiosa.—Involucre many leaved. Calyx 5-parted, with long bristly divisions. Corolla tubular. Filaments much exserted.—*Leaves opposite. Flowers dark purple pink or whitish in heads.* 155

Linnæa.—Calyx 5-cleft. Corolla narrow, bell-shaped, nearly equally 5 lobed. Stamens unequal.—*A trailing evergreen with rose colored flowers in pairs.* 148

Sanguisorba.—Calyx constricted at the throat, 4-lobed, with 2 or 3 scales or bracts at the base externally. Petals none.—*Leaves unequally pinnate. Flowers small, in close spiked heads.* 101

Lycium—Corolla tubular, the throat closed with the beards of the filaments. Stamens often 5. Berry 2-celled.—*Shrubs somewhat climbing, with greenish-purple flowers.* 284

Euonymus.—Sepals 4 or 5, united at the base. Petals 4 or 5, rounded, spreading. Stamens very short, inserted on the upper face of a flat 4 or 5-angled disk.—*Shrubs with 4-sided branches.* 73

**** *Floral envelope consisting of a single petal-like perianth. Leaves parallel-veined.*

Smilacina. See. **Maianthemum.**—Perianth spreading. Stamens 4. Berry 2-celled.—*Flowers racemed, white.* 375

Orontium.—Flowers on a cylindric spadix. Perianth 4 to 6-sepalled. Stamens 4 to 6.—*Flowers yellow, at the summit of the scape. Spathe radical,* 347

Symplocarpus.—Spathe hooded, shell-form, pointed. Spadix roundish, covered with flowers. Perianth deeply 4-parted. Style 4 angled.—*Fœtid herbs, with large veiny leaves, and nearly sessile spathes.* 348

ORDER III. DIGYNIA.—2 *Pistils.*

* *Corolla polypetalous.*

Hamamelis.—Petals 4, strap-shaped. Stamens 8, the 4 alternate with the petals, fertile. Capsule nut-like, 2-celled.—*Shrubs, or small trees, with yellow flowers.* 131

** *Corolla monopetalous.*

Galium.—Calyx minute, 4-toothed. Corolla 4-parted, rotate. Stamens short. Fruit 2-lobed, 2-seeded.—*Slender herbs, with 4-angled stems, and small flowers.* 151

Cuscuta.—Corolla bell-shaped, 4 or 5-cleft. Stamens 4 or 5. Capsule 2-celled, 2 to 4-seeded.—*Leafless, yellowish or reddish herbs.* 279

Gentiana.—Corolla funnel-form, spurless. Capsule 1-seeded. Stamens 4 or 5. Capsule many-seeded.—*Herbs.* 287

ORDER IV. TETRAGYNIA.—4 *Pistils or sessile stigmas.*

* *Pistils seperate, free from the calyx.*

PAGE.

Potomogeton.—Calyx 4-sepalled. Stamens nearly sessile. Fruit 4 nutlets.—*Aquatic submersed herbs, with small greenish flowers on a spike, rising above the water.* 351

Tillæa.—Sepals, petals, stamens, and pistils 3 or 4. Carpels 3 or 4.—*Small tufted herbs.* 125

* * *Pistils combined into one, free from the calyx.*

Sagina.—Sepals, petals, and pistils 4 or 5. Capsule 1-celled, several-seeded.—*Small matted herbs.* 53

Ilex.—Calyx and corolla 4 or 5-parted. Stamens and sub-sessile stigmas 4 or 5.—*Trees or shrubs with spinose-dentate leaves.* 222

CLASS V. PENTANDRIA.—5 *Stamens.*

Order I. Monandria.—1 *Pistil.*

* *Corolla 1-petalled, regular.*

† BORAGINACEÆ.—Herbs, chiefly rough-hairy, with alternate entire leaves, and symmetrical flowers with a 5-parted calyx, a regular 5-lobed corolla, the stamens inserted on its tube, and a deeply 4-lobed ovary, forming in fruit 4 seed-like nutlets. 266

1. Echium.—Corolla obliquely irregular! naked in the throat. Stamens unequal exserted.—*Flowers cyanic.* 266

2. Lycopis.—Corolla regular, funnel-form, with a curved tube, and with 5 obtuse hairy scales in the throat.—*Flowers blue.* 266

3. Symphytum.—Corolla cylindrical-bell-shaped, 6-toothed; the throat closed with 5 awl-shaped scales.—*Flowers white and pink.* 266

4. Onosmodium.—Corolla oblong or ovate-tubular, with erect or converging lobes, and a naked throat.—*Flowers yellowish-white, in spiked racemes.* 267

5. Lithospermum.—Corolla funnel-form, open. Stamens included.—*Flowers white or yellow, in leafy-bracted spikes or racemes.* 267

6. Myosotis.—Corolla salver-form, short, the throat half closed with obtuse scales. Stamens included on short filaments.—*Flowers small, blue or white, in naked racemes* 268

7. Mertensia.—Corolla tubular-bell-form, elongated, with a wide spreading border: scales none.—*Smooth herbs, with showy purplish-blue or white flowers, in terminal racemes or clusters.* 269

8. Echinospermum.—Corolla salver-form. Nutlets prickly-margined.—*Rough hairy and grayish herbs, with small blue flowers in bracted racemes.* 269

9. Cynoglossum.—Corolla funnel-form, the throat closed with 5 obtuse scales. Nutlets prickly all over.—*Course herbs with white or purplish flowers, mostly in panicled racemes.* 269

10. Borago.—Corolla wheel-form, with acute segments, the throat closed with 5 rays.—*Rough herbs, with blue flowers, in 1-sided clusters.* 270

11. Anchusa.—Corolla funnel-form, vaulted; tube straight, orifice closed with 5 prominent scales. Stigma emarginate.—*Exotics, herbs with cyanic flowers.* 270

12. Pulmonaria.—Calyx prismatic, 5-angled. Corolla funnel-form with a cylindric tube; orifice hairy in 5 lines alternating with the stamens.—*Exotic herbs, with mostly blue flowers.* 271

† † HYDROPHYLLACEÆ.—Herbs, commonly hairy, with mostly alternate and cut-lobed or compound leaves, regular 5-parted and 5-androus blue or white flowers, in one-sided cymes or racemes which are coiled from the apex when young.—Style 2-cleft. 271

PAGE.

1. Hydrophyllum.—Corolla bell-shaped, the tube with 5 longitudinal appendages. Stamens exserted. Ovary bristle-hairy.—*Herbs with petioled pinnately or palmately veined leaves, and cymose clustered flowers.* 271

2. Phacelia.—Corolla open-bell-shaped. Capsule 4-seeded, the 2 placentæ linear.—*Hairy herbs, with divided leaves and usually pale-blue flowers in forked racemes.* 272

3. Cosmanthus.—Corolla broadly-bell-shaped, without scales. Ovary 1-celled, hairy above.—*Flowers white or pale-blue, in long bractless racemes.* 273

4. Eutoca.—Corolla broadly-bell-shaped. Capsule 1-celled, 2-valved, many-seeded.—*Flowers blue or white.* 273

5. Nemophila.—Calyx 10-parted, the alternate lobes reflexed. Corolla flat-bell-shaped. Stamens shorter than the corolla. Capsule 4-seeded.—*Flowers blue or white.* 273

††† POLEMONIACEÆ.—Herbs, with alternate or opposite leaves, regular 5-parted flowers, a 3-celled ovary and 3-lobed style. Stamens often unequal or unequally inserted on the tube of the corolla. 274

1. Phlox.—Calyx somewhat prismatic, the segments erect Corolla salver-form, with a curved slender tube; the stamens unequally inserted in its tube.—*Flowers pink, purple, or white.* 274

2. Polemonium.—Calyx bell-shaped, 5-cleft. Corolla bell-shaped-rotate, with a short tube.—*Leaves pinnate. Flowers blue or white, in nearly bractless corymbs.* 276

3. Gilia.—Corolla somewhat funnel-shaped. Stamens inserted on the inner side of the corolla tube.—*Leaves alternate, pinnatifid. Flowers blue, several-flowered, in capitate clusters or panicles.* 276

4. Ipomopsis.—Calyx tubular and membranaceous. Corolla funnel-shaped, the tube much exserted. Stamens inserted in the tube of the corolla. *Leaves finely pinnatifid. Flowers orange, scarlet or reddish, in clustered panicles.* 277

†††† CONVOVULACEÆ.—Twining or trailing herbs, with alternate entire or lobed leaves and regular 5-androus flowers. Flowers usually large and showy, opening but for one day. Stamens inserted into the base of the corolla. 277

1. Calystegia.—Calyx 5-parted, enclosed in 2 large foliaceous bracts. Corolla bell-shaped-funnel-form, 5-folded, the border obscurely 5-lobed or entire. Stigmas 2.—*Leaves heart-shaped or arrow-shaped. Flowers white or light-rose-color, on axillary, solitary peduncles.* 277

2. Convolvulus.—Calyx naked. Corolla bell-shaped or funnel-form, with a spreading nearly entire border. Stamens mostly included.—*Flowers white, pink, blue and purple.* 278

3. Quamoclit.—Sepals 5, mostly mucronate. Corolla tubular-cylindrical. Stamens exserted.—*Leaves often pinnatifid. Flowers white, yellow, orange and scarlet, delicate.* 279

4. Cuscuta.—Plant yellow or reddish, with thread-like naked stems and small scales in place of leaves. 279

††††† SOLONACEÆ.—Herbaceous or rarely shrubby plants, with alternate leaves, regular 5 parted flowers on bractless pedicels, and the fruit a 2-celled (rarely 3 to 5-celled) capsule or berry. Corolla plaited or infolded. Stamens mostly equally inserted on the corolla. Style and stigma simple. 280

1. Nicotiana.—Calyx tubular-bell-shaped, 5-cleft. Corolla funnel-form or salver-form, mostly with a long tube. Capsule 2-celled.—*Acrid herbs, with white flowers, tinged with green or purple.* 280

2. Datura.—Calyx prismatic, 5-toothed. Corolla funnel-form, with a large and spreading 5-toothed plaited border.—*Rank herbs, with large and showy flowers.* 281

PAGE.

3. Hyoscyamus.—Calyx bell-shaped or urn-shaped, 5-lobed. Corolla somewhat irregular, with a 5-lobed plaited border. Capsule 2-celled opening by a lid.—*Rank herbs, with lurid flowers.* 281

4. Nicandra.—Calyx 5-parted, 5-angled, at length bladdery and inclosing the 3 to 5-celled dry berry.—*Smooth herbs.* 282

5. Physalis.—Calyx 5-cleft, at length enlarged and bladdery, and inclosing the 2-celled berry. Corolla spreading bell-shaped.—*Flowers greenish-yellow.* 282

6. Solanum.—Calyx 5 to 10-parted, spreading in fruit. Corolla mostly wheel-shaped, with a very short tube. Stamens exserted, converging around the style.—*Herbs or shrubs.* 283

7. Atropa.—Calyx persistent, 5-cleft. Corolla bell-shaped. Berry globose, 2-celled, situated on the calyx.—*Exotics, with pale blue flowers.* 284

8. Lycium.—Calyx 2 to 5-cleft, short. Corolla tubular, with a mostly 5-lobed spreading limb, the orifice closed with the beard of the filaments. Stamens 4 or 5, exserted.—*Shrubs, somewhat climbing.* 284

9. Capsicum.—Corolla wheel-form, with a very short tube. Fruit a juiceless berry, 2 to 4-celled, many-seeded.—*Herbaceous or shrubby plants, pervaded by a hot pungent principle.* 284

10. Petunia.—Calyx-tube short, with a 5-cleft leafy limb. Corolla funnel-form, with a cylindric tube, the limb in 5 unequal plaited lobes.—*Exotic herbs, with showy flowers.* 285

†††††PRIMULACEÆ.—In part herbs, usually low, with perfect regular flowers, the stamens inserted opposite the lobes of the corolla on its tube, and a 1-celled ovary, bearing several or many seeds. 226

1. Primula.—Calyx tubular, angled, 5-cleft. Corolla funnel-form or salver-shaped. Stamens included.—*Stemless herbs, with the leaves in a cluster from the root.* 226

2. Dodecatheon.—Calyx deeply 5-cleft, the divisions reflexed. Corolla 5-parted, reflexed. Stamens exserted, united. Style exserted.—*Smooth herbs, with clustered radical leaves, and delicate white or purplish flowers in a terminal umbel.* 227

3. Lysimachia.—Calyx 5-parted. Corolla with a very short tube, and 5-parted limb. Filaments often united into a ring at base.—*Herbs, with axillary or racemed yellow flowers.* 227

4. Anagallis.—Calyx 5-parted. Corolla wheel-shaped, with scarcely any tube, 5-parted. Filaments hairy. Capsule globose, the top falling off like a lid, many seeded.—*Small spreading procumbent herbs. Leaves opposite or whorled.* 228

5. Samolus.—Calyx 5-cleft, the tube adherent to the base of the ovary. Corolla bell-shaped, 5-cleft, with sterile filaments in the sinuses.—*Smooth herbs, with small white flowers in racemes.* 229

6. Hottonia.—Calyx 5-parted, with linear divisions. Corolla salver-shaped, with a short tube.—*Aquatic herbs, with pectinate immersed leaves, and white flowers.* 229

††††††CAMPANULACEÆ.—Herbs, with a milky juice, alternate leaves, and scattered flowers; the regular 5-lobed corolla bell-shaped. Stamens free from the corolla, distinct. Stigmas 2 or more. 208

1. Campanula.—Corolla bell-shaped, or rarely nearly rotate. Stigmas 3 to 5. Capsule 3 to 5-celled, opening by lateral valves.—*Flowers spicate or axillary, blue or white.* 208

2. Specularia.—Corolla wheel-shaped, 5-lobed. Filaments hairy. Stigmas 3. Capsule prismatic, 3-celled.—*Low herbs, with blue or white flowers.* 209

PAGE.

* * *Corolla 1-petalled, regular or irregular.*

††††††† CAPRIFOLIACEÆ, in part. Shrubs or rarely herbs, often twining, with opposite leaves, no stipules, the calyx-tube coherent with the 2 to 5-celled ovary. Stigmas 1 to 4. Fruit a berry, drupe or capsule. 145

1. Lonicera.—Calyx 5-toothed. Corolla tubular or funnel-form, often swelled at the base, irregularly or nearly regularly 5-lobed. Stigma capitate. Berry several-seeded.—*Climbing or erect shrubs. Leaves often connate.* 145

2. Diervilla.—Corolla funnel-form, 5-lobed, nearly regular. Capsule oblong, 2-celled, 2-valved.—*Low upright shrubs, with yellowish flowers.* 146

3. Triosteum.—Calyx-lobes 5, leaf-like, persistent. Corolla tubular, swelled at the base, scarcely longer than the calyx. Stigma capitate, lobed.—*Coarse hairy herbs, with the leaves connate around the stem.* 147

4. Symphoricarpus.—Calyx 4 or 5-cleft. Corolla bell-shaped, nearly regularly 4 or 5-lobed. Stamens 4 or 5, inserted into the throat of the corolla. Berry 4-celled, 2-seeded.—*Shrubs, with small whitish flowers in short spikes or clusters.* 147

Vinca.—Corolla salver-form, contorted; border 5-cleft, the tube oblique; orifice 5-angled.—*Upright or trailing shrubs.* 230

Mirabilis.—Perianth funnel-form, with a contracted tube, free from the ovary; limb plaited, entire, deciduous. Stigma globose.—*Showy exotics, with opposite leaves, and white, red, yellow, and variegated flowers.* 302

Menyanthes.—Calyx 5-parted. Corolla short-funnel-form, with a spreading equally 5-lobed limb, hairy within. Stigma 1 or 2-lobed. Capsule 1-celled.—*Leaves 3 at the summit. Flowers reddish, racemed.* 288

Erythræa.—Calyx 4 or 5-parted. Corolla funnel-form, with a slender tube, and 4 or 5-parted limb. Anthers after flowering spirally twisted. Capsule linear, 1 or 2-celled.—*Low herbs, with rose, purple, or reddish cymose flowers.* 286

Sabbatia.—Calyx 5 to 12-parted. Corolla rotate, 5 to 12-parted. Stamens 5 to 12. Anthers at length revolute. Stigmas 2, spiral. Capsule 1-celled.—*Herbs, with slender stems and handsome flowers.* 285

Gentiana.—Calyx 4 or 5-cleft. Corolla 4 or 5-lobed, regular, with folds on the sinuses or fringed on the throat or margins. Style short or none. Stigmas 2.—*Flowers solitary or cymose, showy.* 287

Spigelia.—Calyx 5-parted, persistent, with slender lobes. Corolla tubular-funnel-form, 5-cleft at the summit. Style slender, hairy above. Capsule short, twin.—*Herbs, with showy flowers in spikes or 1-seeded cymes.* 154

Verbascum.—Calyx 5-parted. Corolla 5-lobed, open or concave, rotate, the lobes nearly equal. Stamens often hairy, the anterior longer. Capsule globose, many-seeded.—*Flowers in spikes or racemes.* 235

Azalia.—Calyx 5-parted, often minute. Corolla funnel-form, 5-lobed, slightly irregular. Filaments long, exserted, and usually declined, as well as the long style.—*Upright shrubs, with showy flowers, in umbelled clusters.* 216

Lobelia.—Calyx 5-cleft. Corolla irregular, cleft on the upper side, 2-lipped; lower lip 3-cleft; upper lip of 2 rather erect lobes. Anthers cohering and somewhat curved. Stigma 2-lobed. Capsule 2-celled, many-seeded. *Flowers blue, white or red.* 206

Clintonia.—Calyx, corolla, and stamens nearly as in Lobelia. Capsule silique-form.—*Procumbent herbs, with minute leaves, and axillary solitary flowers.* 207

* * * *Flowers 5-petalled, regular.*

Claytonia.—Calyx 2-leaved, or 2-parted. Petals emarginate or obtuse. Stamens inserted on the claws of the petals. Style 3-cleft.—*Small fleshy herbs, with a pair of opposite leaves, and a loose raceme of white or reddish flowers.* 56

PAGE.

Celastrus.—Calyx minute. Petals sessile. Stamens on the margin of a cup-shaped disk. Pistil on the disk. Seeds 1 or 2 in each cell, erect, enclosed by a pulpy scarlet aril.—*Climbing or twining shrubs, with alternate leaves.* 72

Euonymus.—Sepals 4 or 5, united at the base. Petals 4 or 5, rounded, spreading. Stamens very short. Style short or none.—*Shrubs, with 4-sided branches, and green or dark purple flowers.* 73

Ceanothus.—Calyx 5-lobed. Petals hood-form, on slender claws. Filaments elongated. Fruit 3-lobed, dry and splitting into its 3 carpels when ripe. *Shrubby plants, with white flowers in little umbel-like clusters.* 434

Itea.—Calyx bell-shaped, 5-cleft, free from the ovary. Petals lanceolate, much longer than the calyx and stamens. Styles 2, united.—*A shrub, with white flowers in simple spicate racemes.* 129

***** Flowers 4 or 5-petalled, regular. Fruit a drupe or berry.*

Vitis.—Calyx 4 or 5-toothed. Petals 4 or 5, cohering at the apex, deciduous. Stigma simple, sessile. Berry 2-celled, 1 to 4-seeded.—*Shrubs, climbing by tendrils, with fragrant greenish flowers.* 74.

Ampelopsis.—Calyx nearly entire. Petals 5, concave, spreading. Stigmas capitate.—*Shrubby creepers, with digittate or cordate leaves, and cymose clusters of flowers.* 75

Rhamnus.—Calyx urn-shaped, 4 or 5-cleft. Petals 4 or 5, shorter than the sepals, sometimes very minute or wanting. Stamens 4 or 5. Style 2 to 4-cleft.—*Small trees or shrubs, with minute flowers.* 73

Ribes.—Calyx bell-shaped or tubular, 4 or 5-parted. Petals 4 or 5, small, inserted into the throat of the calyx. Stamens 5, very short. Styles 2, distinct or united.—*Shrubs, often with prickly branches. Fruit mostly edible.* 119

Hedera.—Calyx 5-toothed. Petals 5, dilated at the base. Berry 5-seeded, surrounded by the permanent calyx.—*Exotic shrubby, climbing or erect plants, with simple evergreen leaves, and greenish flowers.* 143

****** Flowers 2, 4 or 5-petalled, irregular. Seeds in a capsule.*

Viola.—Sepals 5, auricled at their base. Petals 5, unequal, the larger one spurred at the base, the 2 lateral equal. Stamens approximate, filaments distinct. Anthers connate. Capsule 1-celled, 3-valved.—*Low herbs, with pretty flowers on angular, solitary peduncles.* 37

Solea.—Sepals not auricled. Petals unequal, the lowest one 2-lobed and somewhat gibbous at the base. Capsule somewhat 3-seeded.—*Flowers greenish, in the axils of the leaves.* 40

Impatiens.—Sepals 5, the lower one spurred, the 2 upper united so as to appear like one. Petals 2, unequal-sided and 2-lobed. Stamens short. Stigmas 5, united. Capsule bursting elastically.—*Herbs, with smooth succulent stems, with tumid joints.* 34

******* Flowers with a single corolla-like perianth.*

Comandra.—Perianth bell-shaped or urn-shaped, the limb 5-cleft, persistent. Anthers adhering to the lobes of the perianth by a tuft of thread.—*Herbs, with alternate oblong and sessile leaves, and greenish-white flowers, in terminal or axillary cymes.* 310

Gomphrena.—Bracts 5, colored, the 3 outer ones keeled. Sepals 5, villous. Disk cylindric, 5-toothed. Utricle 1-seeded.—*Flowers in globose bracts.* 302

Celosia.—Sepals 3 to 5, colored. Stamens united at base by a plaited disk. Style 2 or 3-cleft.—*Ornamental exotics.* 302

PAGE.

ORDER II. DIGYNIA.—2 *Pistils or sessile Stigmas.*

* *Corolla* 1-*petalled.*

GENTIANA.—Calyx 4 or 5-cleft. Corolla 4 or 6-cleft, usually with intermediate plaited folds, appendaged at the sinuses. Style short or none: stigmas 2, persistent.—*Bitter herbs, with solitary or cymose showy flowers.* 287.

CUSCUTA.—Whole plant yellow or reddish, with filiform naked stems, and small scales instead of leaves. 279

APOCYNUM.—Calyx 5-parted. Corolla bell-shaped, 5-cleft, the base furnished with 5 triangular scales, alternating with the lobes. Anthers arrow-shaped, adhering to the stigma.—*Plants with milky acrid juice, opposite entire leaves, and small pale flowers.*—Apocynaceæ. 285

†ASCLEPIADACEÆ.—Plants with milky juice and opposite or whorled entire leaves, regular 5-merous flowers, with a singular connection of the anthers with the stigma, and cohesion of the pollen-masses into wax-like masses. 290

1. ASCLEPIAS.—Calyx and corolla reflexed, deeply 5-parted. Crown of 5 hooded lobes, with or without an incurved horn rising from the base of each. 290

2. GONOLOBUS.—Corolla rotate, 5-parted. Crown a small wavy-lobed ring. Pollen-masses 5 pairs.—*Twining, shrubby or herbaceous plants, with greenish or purplish flowers.* 293

* * *Corolla* 5-*petalled.*

HEUCHERA.—Calyx bell-shaped, coherent with the ovary below, 5-cleft. Petals 5, small, entire. Capsule with 2 beaks, 1-celled.—*Herbs, with round heart-shaped radical leaves, and greenish white or purplish flowers.* 127

PANAX.—Polygamous. Calyx-teeth obsolete. Styles 2 or 3, short. Fruit a 2 or 3-celled and 2 or 3-seeded drupe, often fleshy.—*Leaves palmately compound. Flowers white, in a single simple umbel on a long peduncle.* 113

††UMBELLIFERÆ.—Herbaceous plants, with hollow stems, alternate, mostly compound leaves, with their petioles expanded or sheathing at the base. Flowers in umbels. Fruit consisting of 2-coherent carpels. 131

* Inner face of the seed flat or nearly so.

1. HYDROCOTYLE.—Flowers small white in simple umbels or clusters. Fruit orbicular, flattened.—*Leaves roundish, or kidney-form.* 131

2. CRANTZIA.—Flowers few, in simple involucrate umbels, white. Fruit globular, with red vittæ.—*Leaves linear, fleshy.* 132

3. SANICULA.—Flowers in irregular or compound umbels, greenish or yellowish. Fruit clothed with hooked prickles.—*Leaves palmately lobed or parted.* 133

4. DAUCUS.—Flowers in concave umbels, white. Fruit smooth, the carpels strongly winged on the back and on the edge.—*Leaves finely 2 or 3-pinnate or pinnatifid.* 133

5. HERACLEUM.—Flowers white, the marginal somewhat radiant, in large flat umbels. Fruit broadly wing-margined.—*Leaves 1 or 2 ternately compound.* 134

6. PASTINACA.—Flowers yellow, in large flat umbels. Fruit wing-margined.—*Leaves pinnately compound.* 134

7. ARCHANGELICA.—Flowers greenish or white, in perfect umbels, with a many-leaved involucel. Capsule 3-ridged on the back.—*Leaves 1 or 2 pinnately compound.* 134

8. THASPIUM.—Flowers yellow or dark purple. Fruit elliptical or ovoid: capsule 5-winged.—*Leaves 1 to 4-ternately compound.* 135

9. ZIZIA.—Flowers yellow, in perfect umbels. Fruit oval or somewhat twin, 5-ribbed.—*Leaves dissected.* 136

PAGE.

10. Cicuta.—Flowers white, in perfect umbels. Fruit sub-globose, twin.—*Leaves pinnately or ternately compound.* 136

11. Sium.—Flowers white, in perfect umbels. Fruit ovate-globose.—*Leaves simply pinnate, with serrate leaflets.* 137

12. Cryptotænia.—Flowers white in compound umbels, with very unequal rays. Fruit oblong.—*Leaves 3-parted.* 137

13. Archemora.—Flowers white. Fruit broadly winged.—*Leaves of 3 to 9 linear or lanceolate leaflets.* 138

14. Bupleurum.—Flowers yellow. Fruit ovoid-oblong.—*Leaves simple, entire.* 138

CULTIVATED EXOTICS.

15. Carum.—Flowers white, in perfect umbels, with various involucres. Fruit oval, laterally compressed.—*Leaves dissected.* 138

16. Apium.—Flowers white, in perfect umbels. Fruit roundish, laterally compressed.—*Leaves pinnately dissected.* 139

17. Pimpinella.—Flowers white, in compound umbels, without involucres. Fruit ovate, ribbed, with convex intervals.—*Leaves pinnately many-parted.* 139

18. Fœniculum.—Flowers yellow, in perfect umbels, no involucre. Fruit elliptic-oblong.—*Leaves biternately dissected.* 139

* * Inner face of the seed hollowed out lengthwise, or the margins involute.

19. Chærophyllum.—Flowers mostly white, in diffuse few-flowered umbels. Fruit linear-oblong.—*Leaves bi or tri-ternate, with incisely cleft or toothed segments.* 140

20. Osmorrhiza.—Flowers white. Involucre and involucels few-leaved. Fruit linear oblong, angled.—*Leaves large, 2 or 3-ternately compound.* 140

21. Conium.—Flowers white. Involucre 3 to 5-leaved. Fruit ovate, flattened at the sides.—*Leaves large, decompound.* 141

* * * *Seeds* incurved at base and apex.

22. Erigenia.—Flowers white, in a leafy bracted compound umbel. Fruit twin carpels nearly kidney-form.—*Leaves 2 or 3-ternately divided.* 142

23. Coriandrum.—Flowers white, unilateral. Fruit globose.—*Leaves bipinnate.* 142

* * * *Flowers with a single corolla-like perianth.*

Chenopodium.—Perianth 5-parted, partially enveloping the fruit. Utricle thin, membranaceous.—*Leaves petioled, triangular or rhomboid. Flowers sessile, in small clusters.* 298

Ulmus.—Perianth bell-shaped. Fruit flat, winged, 1-seeded.—*Trees, with rough leaves, and purplish or yellowish flowers in lateral clusters preceding the leaves.* 311

Celtis.—Polygamous. Perianth 5 to 6-parted, persistent. Fruit a globular drupe, with thin flesh.—*Trees or large shrubs, with pointed leaves, and greenish axillary flowers.* 312

Scleranthus.—Utricle in the calyx-tube: stamens on its throat.—*Homely little weeds, with obscure greenish clustered flowers.* 66

Polygonum.—Stamens 4 to 9. Styles or stigmas 2 or 3. Achenium lenticular. *Herbs, with jointed stems.* 303

Beta.—Perianth 5-parted. Styles very short, erect, with acute stigmas. Seed reniform, embedded in the fleshy perianth.—*Stems furrowed. Flowers green in spikes or paniculate racemes.* 296

PAGE.

ORDER III. TRIGYNIA.—3 *Styles or sessile Stigmas.*

* *Corolla 5 petalled.*

RHUS.—Calyx small, 5-parted. Petals 5, ovate, spreading. Drupe, dry, hairy, 1-celled, 1-seeded.—*Shrubs, sometimes climbing by rooting tendrils.* 67

STAPHYLEA.—Sepals 5, oblong. Petals 5, with short claws. Capsule inflated, 3-celled, few-seeded.—*Shrubs, with opposite pinnate leaves.* 72

SPERGULARIA.—Capsule 1 celled. many-seeded.—*Low herbs, with fleshy opposite leaves and small reddish flowers.* 55

HYPERICUM.—Capsule 1-celled, membranaceous.—*Herbs, with entire dotted leaves and yellow flowers.* 44

* * *Corolla 1-petalled, 5-parted.*

VIBURNUM.—Calyx 5 toothed, persistent. Corolla rotate, spreading. Fruit a 1-celled, 1-seeded drupe.—*Shrubs, or small trees, with simple leaves and white flowers in flat cymes.* 149

SAMBUCUS.—Corolla urn-shaped. Fruit a berry-like juicy drupe, containing 3 seeds.—*Shrubby plants, with pinnate leaves, and numerous white flowers in cymes.* 148

ORDER IV. TETRAGYNIA.—4 *Styles or sessile Stigmas.*

PARNASSIA.—Calyx deeply 5-cleft. Petals 5. Sterile stamens clustered at the base of the fertile. Stigmas 4, sessile.—*Flowers solitary, terminating the long naked scapes.* 43

DROSERA.—Calyx deeply 5-cleft. Petals 5. Styles 3 to 5, each 2-parted.—*Low aquatic herbs, with the leaves clothed with reddish gland-bearing bristles.* 42

ORDER V. PENTAGYNIA.—5 *Pistils.*

ARALIA.—Calyx with the margin very short, 5-toothed. Petals 5, spreading. Berry 5-celled.—*Low trees, shrubs or herbs, with 2 or 3-ternately or pinnately compound leaves.* 142

LINUM.—Capsule sub-globose, 10-valved, 10-celled.—*Herbs, with simple and sessile leaves, and blue or yellowish flowers.* 61

STATICE.—Calyx funnel-form, 5 toothed. Petals 5, united at base,—*Salt-marsh plants, with thick radical leaves, and small flowers, in a compound corymb.* 225

ARMERIA.—Calyx tubular bell-shaped; 5-angled. Petals 5, nearly distinct.—*Leaves mostly linear, radical. Flowers rose-colored, on a simple scape.* 226

ZANTHORHIZA.—Sepals and petals hypogynous, distinct. Follicles membranaceous, compressed, 1-seeded.—*Leaves pinnately divided. Flowers dull purple.* 11

CLASS VI. HEXANDRIA.—6 *equal Stamens.*

ORDER I. MONOGYNIA.—1 *Pistil.*

* *Flowers with both calyx and corolla. Leaves reticulate-veined.*

BERBERIS.—Sepals 6, mostly with 2 bracteoles at the base. Petals 6, with 2 glands upon their claws. Berry 2 or 3-seeded.—*Shrubs, with yellow wood.* 16

LEONTICE.—Sepals 6, naked without. Petals 6, with a scale at base within. Style short. Seeds naked on their thick seed-stalk, resembling drupes.—*Herbs.* 17

PAGE.

FLŒRKIA.—Sepals 3, longer than the 3 petals. Style 2-cleft. Ovaries 3. tuberculate.—*A small aquatic, with pinnately divided leaves.* 66

PRINOS.—Flowers mostly diœcious or polygamous. Calyx minute 4 to 6-toothed. Corolla somewhat rotate, mostly 6-parted. Fruit a drupe, with 4 to 6 seeds.—*Shrubs.* 222

GYNANDROPSIS.—Sepals 4, spreading. Petals 4, unequal. Pod linear-oblong, raised on a long stipe.—*Leaves digitate. Flowers racemed.* 35

CLEOME.—Petals 4, minute or roundish. Stamens 4 to 6. Pod sessile or stipitate.—*Leaves simple or digitate. Flowers purplish.* 36

*** Perianth in two rows. Leaves parallel-veined.*

TRADESCANTIA.—Calyx 3-leaved. Petals 3. Filaments bearded. Capsule 2 or 3-celled.—*Leaves keeled. Flowers purple rose-color or white.* 303

COMMELYNA.—Flowers irregular. Stamens unequal. 3 of them fertile, one of which is bent inward: 3 of them sterile and smaller: filaments naked.—*Stems branching.* 302

**** Flowers with a single corolla-like perianth. Leaves parallel-veined.*

†LILIACEÆ.—Herbs, with parallel-nerved sessile or sheathing leaves, regular perfect flowers, with a petal-like 6-merous perianth free from the 2 or 3-celled ovary. Anthers attached by a point. Style single: stigma simple or 3 lobed. 374

* *Fruit* a few-seeded berry, 2 or 3 celled.—*Not bulbous.*

1. ASPARAGUS.—Perianth 6-parted.—*Stems much branching. Leaves thread-like or bristle-form.* 374
2. POLYGONATUM.—Perianth tubular, 6-cleft, bearing the stamens above the middle.—*Flowers axillary, greenish.* 375
3. SMILACINA.—Perianth 4 to 6-parted, spreading, the stamens borne on the base.—*Flowers white, in a terminal raceme.* 375
4. CLINTONIA.—Perianth 6-parted, bell-shaped the stamens at the base of the segments.—*Flowers greenish, umbelled.* 376
5. CONVALLARIA.—Perianth 6-parted, round bell-shaped. Stamens divergent. *Flowers white, fragrant, in a single rank.* 377

** *Fruit* a few to many-seeded capsule, 3-celled.—*Not bulbous.*

6. HEMEROCALLIS.—Perianth funnel-form, lily-like. Stamens declined. Seeds globular, black.—*Leaves linear, keeled. Flowers yellow or reddish.* 377
7. FUNKIA.—Perianth funnel bell-shaped, 6-parted. Stamens declined. Seeds very numerous, flat.—*Leaves more or less heart-shaped. Flowers white or bluish on, bracted scapes.* 378
8. ASPHODELUS.—Perianth 6-parted, spreading, with 6 valves covering the ovary. Capsule globular, many-seeded.—*Exotics.* 378

† *Root bulbous.*

9. ORNITHOGALUM.—Style 3-sided.—*Leaves linear, radical. Flowers corymbed white.* 378
10. ALLIUM.—Flowers umbelled from a spathe.—*Strong-scented herbs, with mostly radical leaves.* 379
11. HYACINTHUS.—Perianth sub-globose or bell-shaped.—*Exotics. Flowers mostly very fragrant.* 380
12. POLYANTHUS.—Perianth funnel-form, incurved. Filaments inserted into the throat. Stigma 3-cleft.—*Exotics. Flowers fragrant, white.* 381

PAGE.

* * * *Fruit* a many-seeded 3-celled loculicidal capsule.—*Bulbous.*

13. Lilium.—Perianth funnel-form or bell-shaped, colored.—*Stem leafy. Flowers large and showy.* 381

14. Erythronium.—Capsule obovate-triangular.—*Leaves 2, smooth, sheathing the base of the 1-flowered scape.* 382

15. Fritillaria.—Perianth bell-shaped, with a broad base and nectariferous cavity above the claw of each segment.—*Flowers showy, but ill-scented.* 383

16. Tulipa.—Perianth bell-shaped. Stigma thick.—*Leaves radical. Flowers showy, solitary, on a scape.* 383

†† *Not bulbous.*

17. Yucca.—Perianth globular or bell-shaped. Style none. Seeds flat.—*Evergreen herbs, with thread-margined leaves and numerous white flowers, in a terminal panicle.* 384

†† AMARYLLIDACEÆ.—Chiefly bulbous and scape-bearing herbs, with linear, flat radical leaves, and regular 6-androus flowers, mostly issuing from a spathe. 365

1. Amaryllis.—Perianth 6-parted, petaloid. Stamens inserted in the throat of the perianth.—*Flowers solitary, issuing from a 1 or 2-leaved spathe.* 365

2. Agave.—Perianth tubular-funnel-form, 6-parted.—*Leaves mostly thick and fleshy, whorled around the base of the scape.* 365

3. Hypoxis.—Spathe 2-leaved.—*Leaves grassy, linear. Flowers yellow on slender scapes.* 366

* Cultivated exotics.

4. Galanthus.—Sepals 3, concave. Crown of 3 small emarginate petal-like segments.—*Flower white, appearing in early spring.* 366

5. Narcissus.—Perianth with 6 regular spreading segments. Crown monophyllus, bell-form, salver-form or with the tube funnel-form. Stigma 3-parted.—*Flowers yellow, straw color or white, issuing from a withering spathe.* 366

6. Leucojum.—Perianth regular, 6-parted, with equal spreading segments.—*Flowers numerous, white, issuing from a terminal spathe.* 367

Uvularia.—Perianth inferior, deeply 6-parted, erect; segments with a nectariferous cavity at base. Filaments very short, growing to the linear anthers. Capsule, 3-angled or 3-lobed.—*Flowers pale yellow, mostly solitary.* 384

Prosartes.—Perianth 6-leaved, bell-shaped-spreading. Stigmas short, recurved. Berry ovoid, pointed, 3 to 6-seeded, red.—*Flowers greenish-yellow, terminal, drooping.* 385

Streptopus.—Perianth 6-leaved, bell-shaped at the base, the 3 inner sepals keeled. Anthers arrow-shaped, 1 or 2-pointed, longer than the filament. *Flowers small, axillary, on thread-like peduncles.* 386

Aletris.—Perianth cylindrical, tubular-bell-shaped, rough-wrinkled on the outside, 6-cleft at the summit. Style awl-shaped, 3-cleft at the apex. —*Leaves spreading clustered. Flowers whitish, in a slender spiked raceme.* 367

Orontium.—Spadix cylindrical, covered with flowers. Perianth of 4 to 6-truncate, concave sepals. Utricle 1 seeded.—*Aquatic herbs, with a yellow spadix.* 347

Pontederia.—Perianth inferior, 6-cleft, 2-lipped, the fleshy persistent base inclosing the 1-seeded fruit. Anthers oval, blue.—*Aquatic herbs, with violet-blue flowers.* 391

Acorus.—Spathe leaf-like. Spadix cylindric, covered with flowers. Sepals 6, distinct, concave. Utricle 1 to few-seeded.—*Pungent aromatic herbs.* 347

PAGE.

* * * * *Perianth single, glumaceous. Grass-like herbs.*

Juncus.—Perianth 6-leaved. Stamens 6, sometimes 3. Stigmas 3. Capsule 3-celled, many-seeded.—*Stems pithy. Flowers greenish or brownish.* 380

Luzula.—Perianth 6-leaved. Stigmas 3. Capsule 1-celled, 3-seeded.—*Leaves linear, equitant. Flowers in a simple raceme.* 389

Order II. Digynia.—2 *Styles or sessile stigmas.*

Polygonum.—Sepals 5. Fruit lenticular.—*Stems jointed. Flowers small.* 303

Order III. Trigynia.—3 *Styles or sessile stigmas.*

* *Perianth 5 or 6-parted, petal-like. Leaves netted-veined.*

Polygonum.—Sepals 5. Achenium triangular.—*Stems jointed. Flowers small.* 303

Rumex.—Perianth 6-leaved, the 3 inner somewhat colored. Achenium triangular.—*Coarse herbs, with greenish flowers.* 306

Smilax.—Perianth deciduous.—*Shrubs or rarely herbs, often prickly.* 372

* * *Perianth 6-parted.—Leaves parallel-veined.*

†MELANTHIEÆ.—Herbs with acrid poisonous properties. Stems simple or rarely panicled. Perianth mostly persistent or withering away, the divisions mostly distinct. 386

* *Flowers* polygamous. *Anthers* heart-shaped or kidney-shaped.

4. Melanthium.—Perianth segments somewhat heart-shaped, with 2 glands at the base, and the stamens on the long claws.—*Flowers cream-color, racemose.* 386

5. Veratrum.—Perianth free from the ovary, the divisions obovate or oblong, longer than the stamens.—*Leaves plaited, 3-ranked. Flowers raceme-panicled.* 387

* * *Flowers* perfect, racemed or spiked.

6. Amianthium.—Perianth free from the ovary, the divisions separate and contracted at the base. Anthers heart-shaped. Styles filiform.—*Flowers handsome.* 387

7. Helonias.—Perianth of 6 spatulate-oblong sepals. Anthers roundish-oval, blue. Styles revolute.—*Leaves lanceolate. Flowers pale-purple, in a short dense raceme, on a naked scape.* 388

† † TRILLIACEÆ.—Herbs, with simple stems, whorled net-veined leaves and rather large terminal mostly solitary trimerous flowers. 373

1. Trillium.—Sepals 3, lanceolate, spreading. Petals 3, larger. Berry 3 sided, 3-celled.—*Low herbs, with a simple stem bearing at the top a whorl of 3 broadly ovate leaves, and a terminal large flower.* 373

2. Medeola.—Perianth revolute, of 3 sepals and 3 petals.—*Stem simple, with a whorl of 5 to 10 leaves near the middle and another of 3 smaller ones near the top.* 374

† † † JUNCAGINEÆ.—Marsh-herbs, with petiole-like leaves, without a blade, and the greenish perianth consisting of 3 petals and 3 sepals. 352

1. Triglochin.—Sepals and petals nearly alike, ovate, concave. Anthers oval, on short filaments.—*Flowers small, greenish, in a spiked raceme.* 352

2. Scheuchzeria.—Sepals and petals oblong, spreading. Anthers linear.—*Leaves grass-like, sheathing the simple stem. Flowers few, in a loose raceme, with sheathing bracts.* 353

PAGE

* * * *Flowers with neither calyx nor corolla. Leaves net-veined.*

SAURURUS.—Flowers white, in a solitary spike. Scales 1-flowered.—*Aquatic. Leaves heart-shaped.* 313

ORDER XIII. POLYGYNIA.—*Many pistils.*

ALISMA.—Sepals 3, green. Petals 3.—*Aquatic herbs, with radical ribbed leaves, and small white or reddish flowers in a branched panicle.* 353

CLASS VII. HEPTANDRIA.—7 *Stamens.*

TRIENTALIS.—Calyx deeply 6 to 8 parted. Corolla deeply 6 to 8-parted, spreading.—*Leaves whorled at the summit. Flowers few, white, on solitary peduncles.* 227

ÆSCULUS.—Calyx bell-shaped, 5-toothed. Petals 4 rarely 5, more or less unequal, with claws.—*Trees or shrubs, with 5 to 7-foliate leaves.* 71

ORDER II—IV. DI-TETRAGYNIA.—*Styles or stigmas* 2 *to* 4.

POLYGONUM.—Sepals colored, mostly 5. Ovary 1-celled.—*Stems jointed.* 308

ULMUS.—Filaments long and slender. Styles 2, short. Fruit a 1-celled 1-seeded samara, winged all around.—*Trees.* 311

SAURURUS.—Ovaries 3 or 4. Calyx and corolla none.—*Aquatic herbs.* 313

CLASS VIII. OCTANDRIA.—8 *Stamens.*

ORDER I. MONOGYNIA.

* *Corolla polypetalous, free.*

JEFFERSONIA.—Sepals 4. Petals 8. Stigma peltate.—*Scape simple, 1-flowered.* 17

HYPOPITYS.—Sepals 4 or 5-colored. Petals 4 or 5, fleshy.—*Parasitic tawny white herbs.* 221

** *Corolla of* 4 *petals.*

† *Petals on the summit of the adherent calyx-tube.*

RHEXIA.—Calyx-tube urn-shaped, narrowed at the apex, with a 4-cleft limb. Petals obovate. Anthers long, curved.—*Leaves 3 to 5-nerved. Flowers cymose, purplish.* 111

EPILOBIUM.—Calyx-tube 4 sided, the limb 4-parted. Anthers short, fixed by the middle. Stigma often with 4 spreading lobes. Seeds crowned with a tuft of hairs.—*Herbs, with nearly sessile leaves.* 113

ŒNOTHERA.—Calyx-lobes 4, reflexed. Anthers mostly linear. Stigma 4-lobed or capitate.—*Herbs, with mostly yellow flowers.* 114

GAURA.—Calyx-tube much prolonged beyond the ovary, with a 4-cleft reflexed limb. Petals somewhat unequal.—*Flowers rose-color or white.* 116

†† *Petals unequal.*

CARDIOSPERMUM.—Sepals 4, the 2 outer smallest. Petals 4, each with an emarginate scale at the base. Stamens unequal. Style trifid.—*Climbing herbs, with biternate leaves.* 70

* * * *Corolla monopetalous.*

† *Flowers with a corolla-like perianth.*

† THYMELACEÆ.—Shrubs, with acrid and very tough bark, entire leaves, and perfect flowers. 308

PAGE.

1. **Dirca.**—Perianth colored, tubular-funnel-shaped, the border wavy or obscurely 4-toothed. Stamens long and slender. Drupe oval.—*Flowers light yellow, preceding the leaves.* 308

2. **Daphne.**—Perianth 4-cleft, marcescent; limb spreading. Drupe 1-seeded. —*Exotic shrubs, with the leaves from terminal buds and the flowers from lateral.* 309

†† *Flowers with both calyx and corolla.*

Oxycoccus.—Calyx superior, 4-cleft. Corolla 4-parted, with long revolute divisions. Anthers tubular, 2-parted.—*Slender trailing shrubs, with evergreen leaves.* 212

Menziesia.—Calyx bell-shaped, deeply 4 cleft. Corolla 4-cleft, globose. Capsule 4-celled, 4 valved.—*Heath-like shrubs, with evergreen leaves.* 215

Vaccinium.—Calyx adherent to the ovary, 4 or 5-toothed. Corolla ovoid, bell-shaped, urn-shaped or cylindrical.—*Shrubs.* 210

Tropæolum.—Calyx 4 or 5-cleft, colored, spurred. Petals 4 or 5, unequal. Fruit 3 indehescent 1-seeded nuts.—*Straggling or twining herbs, with a pungent juice.* 65

Acer.—Polygamous. Capsule a double samara.—*Leaves opposite.* 69

ORDER II. DIGYNIA.—2 *Pistils or sessile stigmas.*

Acer.—Calyx 5 lobed, or 5-parted. Petals 5 or more. Stamens 6 to 8. Samara 2-winged united at base, 1-seeded.—*Trees, with simple palmately-lobed leaves, and mostly polygamous flowers.* 69

Ulmus.—Capsule a single 1-celled samara.—*Trees, with alternate leaves.* 311

ORDER III. TRIGYNIA.—3 *Pistils.*

Chrysosplenium.—Calyx 4 or 5-cleft, colored. Capsule inversely heart-shaped, many-seeded.—*Low herbs, with fleshy leaves, and small flowers.* 129

Polygonum.—Perianth mostly 5-parted, petaloid. Achenium triangular or lenticular.—*Herbs, with jointed stems and small flowers.* 303

CLASS IX. ENNEANDRIA.—9 *Stamens.*

ORDER I. MONOGYNIA.

† **LAURACEÆ.** Aromatic trees or shrubs, with alternate simple leaves, and clustered flowers. 307

ORDER III. TRIGYNIA.—3 *Pistils.*

Rheum. Perianth colored, 6 sepalled, persistent. Stigmas multipid, reflexed. Achenia 3-angled. *Flowers fasciculate, in racemose panicles.* 307

CLASS X. DECANDRIA.—10 *Stamens.*

ORDER I. MONOGYNIA.—1 *Style.*

* *Flowers polypetalous.*

† *Flowers irregular* (mostly papillionaceous.)

Baptisia. Petals 5, nearly equal. Legume stalked in the persistent calyx.—*Herbs, with palmately 3 foliate leaves, and racemed yellow or blue flowers.* 93

PAGE.

CERCIS.—Petals with claws. Stamens unequal.—*Trees, with simple round heart-shaped leaves and rose-colored flowers.* 91

CASSIA.—Petals 5, unequal. Stamens unequal, 3 lower ones longest.—*Herbs, with abrupt pinnate leaves and yellow flowers.* 94

† † *Flowers regular or nearly so.*

DECODON.—Petals and stamens on the tube of the calyx. 5 stamens very long, the alternate ones shorter.—*Herbs, with opposite or whorled leaves and axillary clustered flowers.* 112

CLETHRA. Corolla of 5 distinct petals. Style slender. Stigmas 3. Capsule 3-celled, 3-valved.—*Shrubs, with alternate leaves, and white flowers.* 215

LEDUM.—Stamens 5 to 10, exserted. Capsule 5-celled, 5-valved.—*Low evergreen shrubs, with white flowers.* 218

PYROLA.—Petals converging. Filaments awl-shaped. Style long, mostly declined. Stigmas 5.—*Low smooth evergreen herbs. Leaves roundish. Flowers in a raceme.* 219

CHIMAPHILA.—Petals widely spreading. Filaments dilated and hairy in the middle. Style very short and top shaped, covered by a broad 5-crenate stigma.—*Evergreen herbs, with fragrant white or purplish flowers, corymbed or umbelled.* 220

GERANIUM in Class Monodelphia, Order Decandria.

† † † *Leafless herbs destitute of green.*

HYPOPITYS.—Corolla of 4 or 5 distinct petals. Stamens 8 to 10. Stigma disk-like.—*Flowers racemed.* 221

MONOTROPA.—Corolla of 5 petals. Anthers short.—*A white herb, with a single flower.* 221

* * *Corolla monopetalous.*

VACCINIUM.—Calyx adherent to the ovary, 4 or 5 toothed. Corolla ovoid, bell-shaped, urn-shaped, or cylindrical, 4 or 5-cleft. Style erect, longer than the stamens. Berry globose.—*Shrubs or under-shrubs, with white or reddish flowers.* 210

GAULTHERIA.—Corolla ovoid-tubular, the limb with 5 small revolute lobes. Berry globular, red.—*Spicy evergreen low herbs, with white flowers.* 212

EPIGÆA.—Corolla salver-form, with a 5 parted border, and a long tube, villous within.—*Trailing evergreen herbs with pale rose-colored fragrant flowers.* 213

ANDROMEDA.—Corolla ovoid-cylindrical. Capsule 5-celled, 5-valved, many-seeded.—*Shrubs, with racemed or clustered flowers.* 213

RHODORA.—Corolla irregular and 2-lipped; the upper lip 3-lobed or 3-cleft, the lower 2 parted. Stamens declined.—*A shrub, with pale purple flowers.* 215

RHODODENDRON.—Corolla mostly bell-shaped. Stamens and style mostly declined.—*Shrubs, with glossy evergreen leaves, and large showy flowers, in terminal corymbs or clusters.* 217

KALMIA.—Corolla between wheel-shaped and bell shaped, 5-lobed, with 10 depressions, which hold the anthers. Style straight.—*Evergreen shrubs, with showy flowers in umbel-like corymbs.* 217

PTEROSPORA.—A leafless purplish-brown herb, destitute of green. Corolla ovate-urn-shaped, 5-toothed.—*Flowers in a raceme.* 220

ORDER II. DIGYNIA:—2 *Styles or sessile Stigmas.*

HYDRANGEA.—Marginal flowers often sterile and radiant. Petals ovate, sessile. Stamens 8 to 10, slender. Capsule 2-celled, many-seeded, opening by a hole between the 2 persistent styles.—*Shrubs, with opposite petioled leaves and numerous flowers in compound cymes.* 134

	PAGE.
Saxifraga.—Calyx deeply 5-cleft. Petals 5, entire, with short claws. Capsule 2-beaked.—*Herbs, with clustered root-leaves, and yellow white and greenish flowers.*	127
Mitella.—Petals 5, inserted into the calyx, slender, pinnatifid.—*Slender herbs, with round cordate leaves, and small greenish and white flowers.*	128
Tiarella.—Petals 5, with claws, entire, inserted into the calyx. Stamens long and slender.—*Herbs, with radical cordate leaves and white flowers.*	128
Saponaria.—Calyx tubular, 5-toothed. Petals 5, with long claws. Capsule oblong, 1-celled, 4-toothed at the apex.—*Flowers cymose clustered.*	48
Dianthus.—Calyx tubular, with scaly bractlets at the base. Petals 5, with long claws.—*Ornamental plants, with very showy and fragrant flowers.*	49
Scleranthus.—Sepals 5, united below in an indurated cup, inclosing the 1-seeded utricle.—*Homely weeds.*	55

Order III. Trigynia.—3 *Pistils.*

Silene.—Calyx tubular, 5-toothed, naked. Petals 5, with claws, mostly crowned at the orifice; limb bifid. Capsule 3-celled at base, opening by 6 teeth at the top.—*Flowers solitary or in cymes.*	47
Stellaria.—Calyx 5-sepalled. Petals 5, 2-parted. Capsule 1-celled, 3 or 4-valved.—*Small grass-like herbs, with white flowers in forked cymes.*	51
Arenaria.—Calyx 5-sepalled. Petals 5, entire. Capsule 1-celled, 3-valved.—*Flowers white.*	52

Order V. Pentagynia.—5 *Pistils.*

Lychnis.—Calyx tubular, 5-toothed, naked at the base. Petals 5, with claws; limb slightly cleft.—*Corolla sometimes crowned.*	50
Cerastium.—Calyx 5-sepalled. Petals 5, bifid or emarginate.—*Flowers white, in terminal cymes.*	51
Spergula.—Calyx 5-parted. Petals 5, entire.—*Leaves in whorls. Flowers white, cymose.*	54
Mollugo.—Sepals 5, united at base. Styles short.—*Homely herbs, with verticellate leaves and small white solitary flowers.*	53
Oxalis.—Sepals 5, free or united at base. Petals 5. Stamens unequal, more or less monodelphous.—*Herbs, with leaves of 3 inversely heart-shaped leaflets.*	63
Sedum.—Sepals and petals 5, rarely 4. Carpels 5, many-seeded, with a little scale at the base of each.—*Thick-leaved herbs, with cymose flowers.*	125
Penthorum.—Sepals 5, united at base. Petals 5, or none. Carpels 5, united at the base into a 5-beaked, 5-celled capsule.—*Upright herbs, with yellowish-green flowers.*	126
Portulacca.—Sepals 2, adherent to the base of the capsule, which opens by a lid.—*Fleshy herbs.*	56

Order X. Decagynia.—10 *Pistils.*

Phytolacca.—Perianth 5-leaved. Berry depressed, 10-celled, 10-seeded.	393

CLASS XI. DODECANDRIA.—12 *to* 19 *Stamens.*

Order I. Monogynia.—1 *Pistil.*

Polanisia.—Sepals 4, distinct, spreading. Petals 4, unequal, with claws.—*Strong-scented herbs, with digittate leaves.*	35

PAGE.

* *Petals* 5 *to* 9. (Stamens sometimes 6 to 20.)

Podophyllum.—Sepals oval, caducous, Petals 6 to 9, obovate, concave. Berry large, ovoid, 1-celled.—*Leaves 2, 1-sided, palmately lobed.* 16

Hudsonia.—Calyx 5-cleft. Petals 5. Stigma simple.—*Bushy heath-like small shrubs. Flowers small, bright yellow.* 41

Lechia.—Calyx 3-sepalled, with 2 outer bracts or sepals. Petals 3. Stamens 3 to 12. Stigmas 3. Capsule 3-celled, 3 valved.—*Flowers very small, greenish or purplish.* 41

Portulacca.—Calyx 2-parted. Petals 4 to 6, equal. Stamens 8 to 20. Style mostly 5-cleft—*Fleshy herbs.* 56

Talinum.—Sepals 2, ovate. Petals 5. Stamens 10 to 30 inserted with the petals into the torus. Style filiform, 3-cleft.—*Fleshy herbs.* 57

Cuphea.—Calyx tubular. Petals very unequal, 6 or 7. Stamens in 2 sets. Stigma 2-lobed.—*Herbs, mostly clammy.* 113

* * *Corolla* monodelphous.

Sabbatia.—Calyx 7 to 11-parted. Corolla 7 to 11-parted, wheel-shaped. Style 2-parted. Capsule 1-celled.—*Flowers showy.* 285

Asarum.—Perianth bell-shaped, with a 3-parted limb. Style united, bearing 6 radiating crested stigmas at the apex.—*Leaves kidney-shaped.* 297

ORDER II—VI. DI-HEXAGYNIA.—2 *to* 6 *Styles or Stigmas.*

Hypericum.—Petals 5. Styles 3 to 5. Capsule 1-celled, many-seeded.—*Flowers yellow.* 44

Elodea.—Sepals 5. Petals 5, oblong. Stamens 9 (rarely 12 to 15) in 3 parcels. Styles 3, distinct.—*Flowers purplish.* 46

Reseda.—Sepals many. Petals 4 to 7, unequal, often cleft. Stamens 10 to 40, turned to one side.—*Flowers very small.* 36

CLASS XII. ICOSANDRIA.—*More than* 10 *Stamens placed on the calyx.*

NATURAL ORDER ROSACEÆ. 96

† AMYGDALEÆ.—Calyx entirely free from the solitary ovary, deciduous. Style terminal. Fruit a drupe (stone-fruit).—*Trees or shrubs, with simple leaves, the bark exuding gum.* 96

1. Prunus.—Drupe oval or oblong, covered with a glaucous bloom, the stone flattish, smooth, 2-edged.—*Small trees.* 96
2. Cerasus.—Drupe globular, without a bloom; stone round, smooth.—*Trees or shrubs.* 97
3. Persica.—Drupe very fleshy, tomentose or smooth; stone somewhat compressed, acute, rugosely furrowed and perforated on the surface.—*Small trees.* 98
4. Amygdalus.—Stone perforate and furrowed, ovate, compressed, one edge acute, the other broad, obtuse.—*Shrubs, with reddish flowers.* 98

† † ROSACEÆ proper.—Calyx free from the ovaries, but sometimes enclosing them in the tube. Pistils few to many. Fruit achenia or follicular. 99

* *Pistils* mostly 5, forming few-seeded follicles in fruit. *Style* terminal.

5. Spiræa.—Calyx 5-cleft. Petals 5, roundish, equal. Carpels 3 to 12, distinct.—*Shrubs or herbs, with white or rose-colored flowers.* 99
6. Gillenia.—Calyx tubular, bell-shaped, 5-cleft. Petals 5 linear-lanceolate. Stamens 10 to 20. Carpels 5, distinct.—*Herbs, with 3-foliate incised leaves and whitish flowers.* 100

PAGE.

** *Pistils* mostly numerous, forming seed-like achenia or little drupes in fruit.

7. AGRIMONIA.—Petals 5. Stamens 12 to 15. Styles 2. Achenia 2, invested by the hardened calyx.—*Herbs, with yellow flowers.* 101

8. SANGUISORBA.—Calyx 4-cleft. Petals none. Stamens 4.—*Herbs, with unequally pinnate leaves.* 101

9. POTERIUM.—Flowers monœcious. Calyx-limb 4-parted. Stamens 20 to 30. Style filiform.—*Leaves unequally pinnate.* 102

10. GEUM.—Calyx 5-cleft. Petals 5. Stamens numerous. Style long, persistent. Achenia hooked.—*Leaves pinnate or lyrate.* 103

11. WALDSTEINIA.—Calyx 5-cleft. Petals 5 to 10. Stamens many. Styles 5 to 8.—*Low herbs, with 3 to 5-lobed or divided leaves, and small yellow flowers on bracted scapes.* 103

12. DALIBARDA.—Calyx deeply 5 or 6-parted. 3 of the divisions larger and toothed. Stamens numerous. Styles 5 to 8.—*Low herbs, with creeping and tufted stems, roundish heart-shaped leaves and white flowers.* 103

13. RUBUS.—Stamens numerous, inserted into the border of the disk. Style nearly terminal. Fruit composed of many pulpy carpels, aggregated on a spongy receptacle.—*Half shrubby plants, armed with prickles.* 103

14. ROSA.—Calyx-tube urn-shaped, fleshy. Pistils numerous, inserted on the hollow receptacle that lines the calyx-tube.—*Prickly shrubs, with odd-pinnate leaves, and showy mostly red and white flowers.* 105

*** *Calyx* open and flattish. *Stamens* and *pistils* numerous. *Fruit* of dry achenia, or immersed in the juicy receptacle.

POTENTILLA.—Receptacle flattish, dry. Calyx 10-cleft. Petals 4 or 5.—*Herbs or rarely shrubs, with compound leaves, and solitary or cymose flowers.* 433

FRAGARIA.—Receptacle enlarged and juicy in fruit, bearing the minute achenia over its surface.—*Low herbs, with runners, radical 3-foliate leaves, and white flowers.* 434

††† POMEÆ.—Calyx-tube thick and fleshy in fruit (forming a pome) including and cohering with 2 to 5 ovaries.—*Trees or shrubs, with alternate simple or compound leaves.* 108

15. CRATÆGUS.—Stamens 10 to 15 or many. Styles 1 to 5. Carpels long in fruit.—*Thorny trees or shrubs. Flowers mostly white, in corymbs.* 108

16. AMELANCHIER.—Stamens many. Styles 5. Pome 3 to 5-celled.—*Small trees or shrubs, with simple serrate leaves, and white flowers in racemes.* 109

17. PYRUS.—Stamens numerous. Styles 2 to 5. Carpels thin in fruit, 2-seeded.—*Trees or shrubs, with simple or pinnate leaves, and white or reddish flowers in cymose corymbs.* 109

18. CYDONIA.—Stamens many. Styles 5. Pome 5-carpelled.—*Shrubs, with simple leaves, and mostly solitary flowers.* 111

ORDER I—V. MONO-PENTAGYNIA.—1 *to* 5 *Pistils.*

OPUNTIA.—Stamens numerous, shorter than the petals. Style with numerous erect stigmas.—*Stem composed of flat and broad fleshy joints, bearing clusters of bristles or spines.* 113

DECODON.—Calyx short, 10-toothed, 5 teeth longer and spreading.—*Leaves whorled or clustered. Flowers axillary, purple.* 112

CUPHEA.—Petals 6 to 7, unequal. Stamens 12, in 2 sets.—*Leaves opposite, entire.* 113

CALYCANTHUS.—Calyx lobes imbricated in many rows, colored, leathery or fleshy.—*Shrubs, with dull-purple fragrant flowers.* 112

PAGE.

CLASS XIII. POLYANDRIA.—*Many Stamens inserted on the receptacle.*

ORDER I. MONOGYNIA.—1 *Pistil.*

TILIA.—Fruit leathery, globular, by abortion 1-celled, 1 or 2-seeded.—*Trees, with cordate leaves, and small cymes of flowers.* 61

HELIANTHEMUM.—Sepals 5, the 2 outer smaller.—*Herbs, with yellow flowers, opening only in sunshine.* 40

ACTÆA.—Sepals 4 or 5. Petals 4 to 8, spatulate. Berry many-seed. Stigma depressed.—*Leaves ternately divided. Flowers white, racemed.* 10

CIMICIFUGA.—Petals 3 to 8, spatulate, small, on claws, 2-horned at the apex. Pistils 1 to 8, forming dry follicular carpels in fruit.—*Flowers white in long slender racemes.* 11

SARRACENIA.—Petals and sepals 5. Style umbrella-shaped.—*Leaves pitcher-shaped, inflated. Flowers large, on a scape.* 19

NYMPHÆA.—Sepals 4. Petals numerous. Stigma surrounded with rays.—*Aquatics, with showy white or rose-colored fragrant flowers.* 18

NUPHAR.—Sepals 5 or 6, concave, colored within. Petals numerous, small and stamen like. Stigma discoid, with permanent rays.—*Leaves floating. Flowers yellow.* 19

PHILADELPHUS.—Calyx 4 or 5-parted. Petals 4 or 5-petalled. Style 4-cleft. Capsule 4-celled, 4-valved.—*Shrubs, with opposite leaves, and white flowers.* 130

† PAPAVARACEÆ.—Herbs, with milky or colored juice, alternate simple or divided leaves, and regular flowers with fugaceous sepals. Flowers solitary on long peduncles, never blue. Sepals 2 or 3, falling off when the flower expands. Style short. 20

1. SANGUINARIA.—Sepals 2. Petals 8 to 12, in 2 series.—*A low herb, with thick prostrate rootstocks, filled with scarlet juice.* 20
2. MECONOPSIS.—Sepals 2, hairy. Petals 4. Stigmas 4 to 6, radiating.—*Herbs, with a yellow juice, and pinnatifid leaves.* 20
3. ARGEMONE.—Sepals 3. Petals 4 to 6. Stigmas 4 to 6, radiate.—*Herbs, with prickly spines and yellow juice.* 21
4. CHELIDONIUM.—Sepals 2, smooth. Petals 4. Stigma 2-lobed.—*Herbs, with brittle stems, and yellow juice.* 21
5. PAPAVER.—Sepals 2, concave. Petals 4. Stigma sessile, united in a flat 4 to 20-rayed crown.—*Exotics.* 21
6. ESCHSCHOLTZIA.—Sepals 2, cohering by their edges. Petals 4. Stigmas 4 to 7, sessile.—*Glaucous herbs, with 2 to 3-pinnatifid leaves, with linear segments, and yellow flowers.* 22

See *Hudsonia, Podophyllum, Portulacca, Talinum, Hypericum, Reseda* and *Cuphea* in Class Dodocandria.

ORDER II—XIII. DI-POLYGYNIA.—2 *to many Styles or Stigmas.*

† RANUNCULACEÆ.—Herbaceous plants, occasionally climbing, with usually palmately or ternately lobed or divided leaves, with half clasping petioles. 1

1. CLEMATIS.—Calyx 4 (rarely 5 to 8)-sepalled, colored, pubescent. Achenia numerous, bearing long plumose tails.—*Perennial vines, with mostly compound and opposite leaves.* 2
2. ANEMONE.—Sepals 5 to 15, petal-like, colored. Achenia mucronate.—*Herbs, with radical leaves, a 2 or 3-leaved involucre, and whitish flowers.* 2

PAGE.

3. HEPATICA.—Involucre 3-leaved, resembling a calyx. Petals 5 to 9, disposed in 2 or 3 rows. Carpels many, without awns.—*Leaves all radical, 3-lobed. Flowers blue or whitish, simple.* 3

4. THALICTRUM.—Sepals 4 or more, petal-like. Achenia 4 to 15, dry, tipped by the stigma or style.—*Herbs, with 2 or 3 ternately compound leaves, and white or greenish flowers.* 3

5. RANUNCULUS.—Sepals 5, deciduous. Petals 5, or rarely more, with a little scale at the base inside. Carpels numerous, in a globose or cylindrical head.—*Herbs, with mostly radical leaves, and yellow flowers.* 4

6. HYDRASTIS.—Sepals 3, ovate. Carpels berry-like, numerous, in a globose head.—*A low herb, with a single radical leaf, a simple hairy stem 2-leaved near the summit, and a single greenish-white flower.* 7

7. CALTHA.—Calyx colored, with 5 to 10 roundish sepals. Pistils 5 to 10.—*Smooth herbs, with round heart-shaped or kidney-form leaves, and yellow flowers.* 7

8. TROLLIUS.—Sepals 5 to 15, petaloid. Petals 5 to 25, small, linear. Pistils many.—*Leaves palmately parted. Flowers large, solitary and terminal.* 8

9. COPTIS.—Sepals 5 to 7. Petals 5 to 7, small, hooded. Pistils 3 to 7 on slender stalks.—*Low smooth herbs, with radical leaves, a long yellow rhizoma and white flowers.* 8

10. AQUILEGIA.—Petals 5, longer than the 5 deciduous sepals, spurred, tubular. Pistils 5, with slender styles.—*Herbs, with 2 or 3-ternately compound leaves, and large, showy, nodding flowers.* 8

11. DELPHINIUM.—Upper sepals spurred. Petals 4, irregular, the upper pair terminating in a tubular spur, enclosed in the calyx-spur.—*Flowers blue, white, red or purple.* 9

12. ACONITUM.—Upper sepals hooded, recieving the 2 long-clawed petals.—*Leaves palmate or digitate.* 10

13. ACTÆA and 14 CIMICIFUGA in Order I. ZANTHORIZA in Class V, Order V.

16. HELLEBORUS.—Sepals 5, persistent, mostly greenish. Petals 8 to 10, very short, tubular, 2-lipped. Stigmas 3 to 10. Follicles 3 to 10.—*Flowers large, nodding, greenish.* 12

* *Cultivated exotics.*

17. PÆONIA.—Sepals 5, unequal. Petals 5. Stamens numerous, mostly changed to petals. Stigmas double. Ovaries 2 to 5.—*Flowers large and showy, terminal.* 12

18. ADONIS.—Sepals 5, appressed. Petals 5 to 15, with naked claws. Achenia in a spike, pointed with the persistent style.—*Leaves finely divided. Flowers mostly red.* 12

19. NIGELLA.—Calyx of 5 colored sepals. Petals 5, 3-cleft. Styles 5.—*Leaves in many linear subulate segments.* 13

† † *Styles 2 to 5.—Herbs, or shrubs.*

HYPERICUM.—Sepals 5, more or less united. Petals 5. Capsule membranaceous.—*Leaves opposite, entire, punctate with pellucid dots. Flowers yellow.* 44

ASCYRUM.—Sepals 4, the 2 inner ones much smaller. Petals 4.—*Low plants, with pale black-dotted leaves and pale-yellow flowers.* 45

ASIMINA.—Sepals 3, united at the base. Petals 6, in 2 rows, inner ones smallest. Pistils few forming large oblong pulpy fruit.—*Shrubs, with dull-colored axillary and solitary flowers.* 15

RESEDA.—Sepals many. Petals 4 to 7, often cleft, unequal. Stamens turned to one side.—*Herbs, with very small flowers.* 36

† † † *Styles numerous.*

MAGNOLIA.—Sepals 3, deciduous. Petals 6 to 12, in concentric series. Stamens distinct, with short filaments and long anthers.—*Trees or shrubs, with large fragrant flowers.* 13

PAGE.

Liriodendron.—Sepals 3, caducous. Petals 6, in 2 rows, forming a bell-shaped corolla. Carpels imbricated in a cone.—*Large trees, with showy flowers.* 14

Brasenia.—Calyx of 3 or 4 sepals. Petals 3 or 4. Carpels oblong, acuminate 1 to 2-seeded.—*Aquatic herbs, with floating centrally peltate leaves, and solitary axillary flowers.* 17

Nelumbium.—Calyx petaloid, of 4 to 6 sepals. Petals numerous. Carpels numerous. Seeds large, round.—*Aquatic herbs, with peltate fleshy radical leaves, and very large yellowish-white flowers.* 18

CLASS XIV. DIDYNAMIA.—4 *Stamens, 2 longer than the other 2.*

Order I. Gymnospermia.—*Seeds apparently naked.*

† LABIATÆ.—Herbs, with square stems, opposite aromatic or strong-scented leaves, and a more or less 2-lipped corolla. 249

* *Corolla with the border nearly equally 4 or 5-cleft.*

1. Isanthus.—Stamens 4, nearly equal. Corolla 5-lobed.—*A clammy herb, with pale blue flowers.* 249
2. Mentha.—Stamens 4, distant. Corolla 4-lobed; lobes spreading.—*Aromatic herbs, and small pale-purplish flowers in close axillary whorls.* 250
3. Lycopus.—Stamens 2. Corolla 4-lobed; lobes spreading.—*Leaves sharply toothed or pinnatifid. Flowers white, whorled.* 251
4. Origanum.—Stamens 4, Corolla 4-lobed, the upper lobe or lip erect.—*Flowers purplish, crowded in cylindrical or oblong spikes.* 251

** *Corolla evidently 2-lipped.*

5. Collinsonia.—Calyx 2-lipped. Corolla elongated, the pendent middle lobe of the lower lip much longer than the others, lacerate-fringed. Stamens 2, much exserted.—*Flowers yellowish.* 252
6. Hedeoma.—Calyx 2-lipped; the lower lip 2-cleft. Upper lip of the corolla flat, the lower equally 3-lobed. Stamens 2, erect, exserted.—*Leaves small. Flowers pale blue.* 252
7. Cunila.—Calyx equally 5-toothed. Upper corolla-lip flattish, the lower somewhat unequally 3-lobed. Stamens erect, exserted.—*Flowers small white or purplish, in corymbed clusters.* 252
8. Blephilia.—Calyx short 2-lipped, the 3 teeth of the upper lip awned. Corolla dilated at the throat, the lips oblong. Stamens 2.—*Flowers pale bluish-purple, crowded in axillary and terminal globose whorls.* 253
9. Monarda.—Calyx tubular, 5-toothed. Corolla-lips linear, the upper involving the filaments. Stamens 2.—*Flowers large, showy, in a few capitate whorls.* 253
10. Salvia.—Calyx and corolla strongly 2-lipped. Stamens 2.—*Flowers usually large and showy.* 254

*** *Stamens 4, the upper pair longer.*

11. Cedronella.—Stamens all ascending. Upper lip of the corolla flattish, the throat much enlarged.—*Sweet-scented herbs, with pale purplish flowers.* 255
12. Nepeta.—Stamens all ascending. Upper corolla-lip more or less concave or vaulted. Anthers mostly approximate. 255
13. Dracocephalum.—Stamens all ascending under the upper lip. Upper calyx-tooth largest, ovate. Bracts awn-toothed. 256
14. Lophanthus.—Stamens diverging, exserted, the upper pair curved downward, the lower ascending.—*Flowers small, crowded in terminal spikes.* 256

**** *Stamens 4, the lower pair longer.*

PAGE.

15. Pycnanthemum.—Calyx nearly equally 5-toothed, naked in the throat.—*Flowers whitish or flesh colored.* 257

16. Thymus.—Calyx 2-lipped, woolly in the throat. Corolla short, slightly 2-lipped.—*Low mostly diffuse herbs, with small leaves.* 258

***** *Stamens ascending in pairs, under the vaulted upper lip.*

17. Clinopodium.—Calyx tubular, 13-nerved, more or less 2-lipped, 5-toothed. Upper corolla lip flattish.—*Flowers purplish, in capitate whorls.* 258

18. Melissa.—Calyx naked in the throat. 13-nerved. 5-toothed, more or less 2-lipped.—*Flowers whitish, in loose one-sided clusters.* 258

19. Prunella.—Calyx 2-lipped, the upper lip truncate, 3-toothed, flat. Upper corolla-lip arched.—*Flowers violet or flesh-colored, in clusters of 6.* 259

20. Scutellaria.—Lips of the vaulted calyx entire. Upper corolla lip-arched, entire.—*Bitter herbs, with axillary spiked or racemed flowers, mostly blue.* 259

21. Physostegia.—Calyx 5-toothed, inflated bell-shaped after flowering. Upper lip of the inflated corolla somewhat spreading.—*Flowers large and showy, flesh colored or purplish, in crowded spikes.* 261

22. Lamium.—Calyx 5-nerved, 5-toothed. Throat of the corolla inflated, lateral lobes truncate or with a tooth-like appendage.—*Decumbent herbs, with axillary whorled clusters of purplish flowers.* 261

23. Leonurus.—Calyx 5-nerved. 5 toothed. the teeth awl-shaped, rigid or spine-like.—*Upright herbs, with cut lobed leaves.* 261

24. Galeopsis.—Calyx 5 to 10-awned, with 5 spiny pointed teeth. Throat of the corolla inflated.—*Herbs, with spreading branches.* 262

25. Stachys.—Calyx 5 to 10-flowered, 5-toothed.—*Herbs with 2 to many-flowered whorls, approximated in terminal racemes or spikes.* 262

26. Marrubium.—Calyx tubular, mostly 10-toothed. Stamens in the corolla-tube.—*Whitish woolly bitter herbs, with whitish flowers.* 263

****** *Stamens curved, ascending and much longer than the corolla.*

27. Trichostema.—Calyx unequally 5-cleft. Corolla-limb unequally 5 cleft, the lobes declined.—*Herbs, somewhat clammy, with blue flowers.* 263

28. Teucrium.—Calyx equally or unequally 5-toothed. Corolla deeply cleft between the 2 upper lobes, the stamens exserted from the cleft.—*Herbs downy.* 264

CULTIVATED EXOTICS.

29. Ocymum.—Corolla inverted or sub-bilabiate, the 4 upper lobes nearly equal. Exterior filaments with a process at their base. 264

30. Lavendula.—Calyx tubular. nearly equal.—*Shrubby odoriferous plants, with narrow rigid leaves and small white flowers.* 264

31. Rosmarinus.—Calyx ovate-bell-shaped.—*An erect evergreen shrub, with bright blue flowers, axillary and terminal.* 265

32. Satureja.—Calyx 5-toothed, tubular 10-ribbed.—*Leaves numerous, small narrow. Flowers pink-colored, in axillary cymes.* 265

33. Hyssopsus.—Calyx 5-toothed.—*Foliage delicate. Flowers bright blue, in one-sided cymes.* 265

†† VERBENACEÆ.—Herbs or shrubs, with opposite leaves and a more or less 2-lipped irregular corolla. Fruit dry or drupaceous, usually splitting when ripe into a 1 to 4-seeded nutlets. 247

1. Verbena.—Calyx 5-toothed, tubular. Corolla tubular, often curved, salver-form, the border somewhat unequally 5-cleft. Style slender.—*Herbs, with mostly alternately spicate bracted flowers, sometimes bracted or corymbed.* 247

2. Phryma.—Calyx and corolla 2-lipped. Style slender. Fruit 1-celled, 1-seeded.—*Flowers small, purplish or rose-color, opposite.* 248

3. Lippia.—Calyx and corolla 2-lipped. Fruit 2-celled, 2-seeded.—*Heads of flowers on axillary peduncles.* 249

ORDER II. ANGIOSPERMIA.—*Seeds in a distinct capsule.*

PAGE.

† SCROPHULARIACEÆ.—Chiefly herbs with the stamens inserted on the tube of the 2-lipped or more or less irregular corolla. Fruit a 2-celled and usually many-seeded capsule or pod. Style single. 235

2. LINARIA.—Calyx 5 parted. Corolla tubular, with a palate, and a spur at the base on the lower side. Capsule opening by 2 chinks.—*Herbs.* 236

3. ANTIRRHINUM.—Calyx 5-sepalled. Corolla gibbous (not spurred) at base, the throat closed by the prominent palate. Capsule opening by 3 pores.—*Flowers showy, in leafy terminal racemes.* 236

* *Stamens 4,* with a 5th rudimentary scale or sterile filament.

4. SCROPHULARIA.—Corolla inflated, globular or oblong, with a short border. *Flowers greenish-purple. in loose cymes, forming a terminal panicle.* 237

5. COLLINSIA.—Corolla deeply 2-lipped, gibbous on the upper side, the middle lobe of the lower lip keeled-sac-shaped, inclosing the stamens. 237

6. CHELONE.—Corolla tubular, inflated above, the mouth a little open. Anthers woolly.—*Leaves opposite, serrate. Flowers white or purplish.* 237

7. PENTSTEMON.—Corolla tubular, often enlarging above. Sterile filament long, bearded or naked.—*Flowers showy, in thyrsoid panicles.* 238

** *Stamens 4,* without a rudimentary fifth.

8. PAULONIA.—Corolla-tube long declinate, enlarged above.—*An ornamental tree, with very large leaves, and purplish flowers.* 238

9. DIGITALIS.—Corolla bell-shaped, ventricose, in 5 subequal lobes.—*Flowers large, in showy racemes.* 239

10. MIMULUS.—Calyx prismatic, 5-angled, 5-toothed. Corolla tubular, the upper lip erect or reflexed-spreading, the lower spreading, 3-lobed.—*Herbs, with square stems, and handsome flowers on solitary axillary peduncles.* 239

11. HERPESTIS.—Calyx 5-parted, unequal, the upper divisions broadest and often longest. Corolla short.—*Prostrate or creeping.* 240

† *Lobes of the corolla flat and open.*

15. LIMOSELLA.—Corolla open bell-shaped, 5-cleft.—*Small and creeping fleshy herbs, with single flowers.* 241

13. BUCHNERA.—Calyx 5-toothed. Corolla salver-form, with a straight or curved tube.—*Flowers blue, in terminal bracted spikes.* 244

19. GERARDIA.—Calyx 5-toothed or cleft. Corolla enlarged above.—*Flowers showy, purple or yellow, often in racemes or spikes.* 244

† † *Upper lip of the tubular corolla erect, arched, including the 4 stamens.*

20. CASTILLEJA.—Calyx cleft down the lower, and often also on the upper side. Lower corolla-lip very small.—*Leaves entire or cut-lobed, the floral ones colored red or yellow.* 245

21. SCHWALBEA.—Calyx 5-toothed, very oblique, the upper tooth smallest.—*Flowers dull yellow, in a loose spike.* 246

22. PEDICULARIS.—Pod ovate or sword-shaped.—*Leaves pinnatifid. Flowers in terminal spikes, yellowish or purplish.* 245

23. MELAMPYRUM.—Calyx 4-cleft. Corolla ringent or personate.—*Flowers yellowish, remote, one-sided, axillary.* 247

* * * *Trees,* shrubs or herbs often twining or climbing.

TECOMA.—Calyx bell-shaped, 5-toothed. Corolla funnel-form, 5-lobed, slightly irregular. Capsule long and narrow.—*Trees or shrubs often climbing, with digitate or pinnate leaves.* 232

MARTYNIA.—Calyx 5-cleft. Corolla gibbous, bell-shaped. Capsule at length with 2 long hooked horns.—*Leaves subcordate. Flowers large, racemed.* 233

PAGE.

Dipteracanthus.—Corolla funnel-form, the spreading limb nearly regularly and equally 5-cleft. Anthers arrow-shaped.—*Flowers blue or purple, clustered.* 234

Thunbergia.—Calyx double, 5-cleft, with 2 bracts. Corolla bell shaped, with an inflated tube, and 5-lobed limb.—*Exotic climbing herbs, with showy axillary flowers.* 235

* * * * *Herbs* destitute of green foliage.

Epiphegus.—Upper flowers sterile, with a tubular corolla; the lower fertile, with the corolla minute and not expanding. 231

Conopholis.—Flowers in a dense spike, scaly throughout. Corolla ventricose, 2 lipped. Stamens protruded. 231

Aphyllon.—Flowers solitary on naked peduncles or scapes. Corolla tubular. Stamens included. 232

CLASS XV. TETRADYNAMIA.—6 *Stamens, 4 long and 2 short*

Order I. Siliculosæ.—*Pod short and broad.*

1. Thlaspi. 2. Capsella. 3. Eriophila, page 25. 4. Lepidium. 5. Camelina, 6. Cochlearia page 26.

CULTIVATED EXOTICS.

7. Alyssum. 8. Lunaria. 9. Iberis, page 27. 10. Isatis, page 28.

Order II. Siliquosæ.—*Pod mostly long and narrow.*

11. Dentaria.—Silique narrow-lanceolate, with the long style.—*Stem with a few divided leaves, and white-purple flowers.* 28

12. Barbarea.—Pod 4-angled, and somewhat 2 edged.—*Leaves lyrately pinnatifid. Flowers yellow.* 29

13. Nasturtium.—Pod nearly terete, linear-oblong and curved upwards like a silicle. Seeds small, irregularly 2-rowed in each cell, marginless.—*Aquatic or marsh plants, with yellow or white flowers, and pinnate or pinnatifid leaves.* (The generic description on page 29 is wrong.) 29

14. Arabis.—Pod linear, plane; seeds in a single row in each cell.—*Flowers white.* 30

15. Iodanthus.—Pod linear, elongated, terete. Style thick.—*Flowers violet-purple, in panicled racemes.* 30

16 Cardamine.—Pod linear, flattened, usually opening elastically.—*Flowers white or purple.* 31

17. Sysimbrium.—Pod terete or rather 4 to 6-sided.—*Flowers small, white or yellow.* 31

18. Erysimum.—Pods columner, 4-sided.—*Flowers yellow.* 32

19. Sinapsis.—Pods nearly terete, with a short beak.—*Leaves lyrate, pinnatifid or incised. Flowers yellow.* 32

20. Raphanus.—Pod elongated, transversely many-celled.—*Flowers yellow or purplish.* 33

21. Cheiranthus.—Pod terete or compressed. Stigma 2-lobed or capitate.—*Flowers fragrant showy, pale-purple or orange-yellow.* 33

CULTIVATED EXOTICS.

22. Hesperis.—Pod 4-sided, 2-edged or sub-terete. Stigmas forked.—*Flowers purple.* 34

23. Matthiola.—Pod terete.—*Herbaceous or shrubby plants, clothed with a heavy pubescence.* 34

24. Brassica.—Pod sub-compressed.—*Flowers yellow.* 34

CLASS XVI. MONODELPHIA.—*Filaments combined in one set.*

ORDER III—V. TRI-PENTANDRIA.—3 *to* 5 *Stamens in one set.*

PAGE.

TIGRIDIA.—Spathe 2-leaved; keeled, 1-flowered. Perianth 6-parted with oblong segments. Stamens 3; filaments united into a long tube.—*Flowers large, very evanescent, yellow and red.* 370

PASSIFLORA.—Calyx 5-parted, colored, the throat crowned with a double or triple fringe. Petals 5 or none. Stamens 5, their filaments situated on the stipe of the ovary. Stigmas 3.—*Climbing herbs or shrubs, with palmately lobed leaves.* 121

LINUM.—Sepals, petals and styles 5. Capsule 5 to 10-celled. 61

ORDER X. DECANDRIA.—10 *Stamens in one set.*

GERANIUM.—Sepals and petals 5, regular. Stamens all fertile, the alternate ones longer, and with scales at the base.—*Peduncles* 1, 2, *or* 3-*flowered.* 62

OXALIS.—Sepals and petals 5. Styles 5.—*Leaves mostly* 3-*foliate.* 63

STYLOSANTHUS, page 88. TEPHROSIA and AMORPHA, page 90. LUPINUS, page 93.

ORDER XIII. POLYANDRIA.—*Many Stamens in one set.*

† MALVACEÆ.—Herbs or shrubs, with alternate stipulate leaves and regular flowers, with numerous stamens, monodelphous in a column. Pistils several. 57

1. MALVA, page 57. 2. ALTHEA. 3. HIBISCUS, page 58. 4. ABUTILON, page 59.
5. SIDA, page 60.

CLASS XVII. DIADELPHIA.—*Filaments in 2 sets.*

ORDER VI. HEXANDRIA.—6 *Stamens.*

† FUMARIACEÆ.—Delicate smooth herbs, with compound dissected leaves, and irregular flowers, with 4 somewhat united petals. 22

1. DICENTRA.—Sepals 2, small. Corolla heart-shaped, or 2-spurred.—*Low stemless perennials, with simple scapes.* 23

2. CORYDALIS.—Corolla 1-spurred at the base, deciduous. Style persistent. Fruit a many-seeded pod.—*Flowers in racemes.* 23

3. ADLUMIA.—Corolla heart-shaped, persistent, 4-lobed at the apex.—*A climbing vine.* 24

4. FUMARIA.—Corolla 1-spurred. Fruit small, globular. 24

ORDER VIII. OCTANDRIA.—8 *Stamens in 2 sets.*

POLYGALA.—Sepals 5, persistent, 2 of them urn-shaped and colored. Petals 3 to 5, united to the stamens, the lower one keel-form. 76

ORDER X. DECANDRIA.—10 *Stamens in 2 sets* (mostly 9 and 1).

† LEGUMINOSÆ.—Herbaceous plants, shrubs or trees, with alternate mostly compound leaves, and papilionaceous flowers. Pistil single. Fruit a legume. 77

* *Herbs* with abruptly pinnate leaves, the common leaf-stalk produced into a tendril or bristle. *Peduncles* axillary.

PAGE.

1. Vicia.—Style bearded round the apex, or down the anterior side. 77

2. Lathyrus.—Style bearded on the posterior side, flattened. 78

3. Pisum.—Legume oblong, tumid, many-seeded. 80

4. Cicer.—Legume turgid, 2-seeded.—*Flowers white.* 80

5. Faba.—Legume large, coriaceous, somewhat tumid.—*Herbs, without tendrils.* 80

** Twining or trailing plants, with odd-pinnate leaves of 2 to several leaflets, destitute of tendrils.

6. Phaseolus.—Keel spiral.—*Leaves 3-foliate, stipellate.* 81

7. Apios.—Keel incurved, at length twisted.—*Leaves* 5 *to* 7-*foliate.* 82

8. Galactia.—Calyx 4-cleft.—*Leaves pinnately tri-foliate.* 82

9. Centrosema.—Calyx short, 5-cleft, with 2 bracteoles. Peduncles few-flowered.—*Leaves pinnately tri-foliate.* 83

10. Amphicarpa.—Calyx 4 or 5-toothed. Peduncles many-flowered.—*Leaves pinnately tri-foliate.* 83

11. Wistaria.—Calyx bilabiate. Wings and keel sickle-shaped.—*Twining shrubby plants, with pinnate leaves, and blue flowers in racemes.* 83

*** *Legume* separating into 2 to several 1-seeded joints. *Leaves* 3 to many-pinnate.

12. Æschynomene.—Stamens equally diadelphous (5 and 5). Legume several-jointed.—*Leaflets numerous.* 84

13. Hedysarum.—Legume with many joints.—*Leaves odd-pinnate.* 84

14. Desmodium.—Stamens mostly diadelphous (9 and 1). Legume several-jointed.—*Leaflets* 2. *Flowers purple or purplish.* 85

15. Lespedeza.—Anthers uniform. Legume of a single 1-seeded joint, oval or roundish.—*Leaflets* 3. 87

16. Stylosanthes.—Stamens monodelphous; anthers of 2 forms. Legume 1 or 2 jointed.—*Leaflets* 3. 88

**** *Herbs, shrubs,* or *trees*, not twining, climbing or tendril-bearing.

17. Astragalus.—Legume partly or quite 2-celled.—*Herbaceous or shrubby. Leaves odd-pinnate.* 89

18. Robinia.—Style bearded.—*Trees or shrubs, with prickly spines pinnate leaves, and showy racemose flowers.* 89

19. Tephrosia.—Stamens monodelphous or scarcely diadelphous.—*Silky-hoary herbs, with odd-pinnate leaves, and white and purplish flowers.* 90

20. Amorpha.—Stamens monodelphous merely at the base. Petal one.—*Shrubs, with odd-pinnate leaves.* 90

21. Trifolium.—Flowers in dense heads.—*Leaves trifoliate.* 90

22. Melilotus.—Flowers in spiked racemes.—*Leaves pinnately trifoliate.* 92

23. Medicago.—Flowers racemed or spiked. Legume more or less spiral.—*Leaves trifoliate.* 92

24. Crotalaria.—Legume inflated, oblong.—*Leaves simple. Flowers yellow.* 93

25. Lupinus.—Stamens monodelphous.—*Leaves palmately* 5 *to* 15-*foliate.* 93

***** *Stamens* distinct. *Corolla* truly papilionaceous.

26. Baptisia.—Legume stalked in the persistent calyx, inflated.—*Leaves 3-foliate.* 93

27. Cercis.—Trees with simple rounded heart-shaped leaves.—*Flowers rose-colored.* 94

CLASS XVIII. SYNGENESIA.—5 *Anthers united in a tube.*

PAGE.

Obs. The plants of this class, with a few exceptions, have 5 anthers united into a single tube. The flowers are in heads inserted upon a common receptacle, which is surrounded by an involucre: being usually known as *Compound Flowers*. They form the Natural order Compositæ. 155

†TUBULIFLORÆ.—Corolla of the perfect or disk flowers tubular, regular, the limb 5-cleft or lobed; the ligulate or ray flowers when present either pistillate only or neutral (with neither stamens or pistils), and occupying the border. 156

* Heads discoid (*without ray-flowers*); the flowers all alike, perfect tubular; branches of the style slender thread-form or bristle-form.

* *Flowers* violet or purple.

VERNONIA, page 156. ELEPHANTOPUS, page 156.

** Heads discoid or radiate; branches of the style much elongated, obtuse or club-shaped.—*Leaves mostly opposite.*

* *Heads* without ray-flowers. *Flowers* all alike, tubular, blue, purple or whitish not yellow.

LIATRIS, page 157. KUHNIA, p. 158. MIKANIA, p. 158. CONOCLINIUM, p. 158. EUPATORIUM, p. 159.

** *Heads* radiate (with ray-flowers); *flowers* dissimilar, or diœcious purplish yellow.

NARDOSMA, p. 161. TUSSILAGO, p. 161.

*** Heads radiate, rarely discoid; branches of the style more or less flattened and linear.—*Leaves mostly alternate.*

* *Heads* radiate; *rays* white, reddish, blue or purple, very rarely yellow.

ASTER.—Heads many-flowered. Disk yellow, often changing to purple. 162

GALATELLA, p. 166. ERIGERON, p. 167. DIPLOPAPPUS, p. 168. BOLTONIA, 169. SERICOCARPUS, p. 169. CALLISTEPHUS, p. 170. DAHLIA, p. 170.

** *Heads* radiate; *rays* yellow, rarely whitish.

SOLIDAGO.—Heads few or many-flowered, small.—*Flowers expanding in the autumnal months.* 171

CHRYSOPSIS.—Heads many-flowered.—*Flowers large, golden yellow, terminating the branches.* 174

INULA.—Heads many-flowered, large.—*Leaves large.* 175

ECLIPTA.—Heads many-flowered, small, with minute flowers. 175

*** *Heads* discoid; *flowers* purplish.

PLUCHEA.—Heads many-flowered, in corymbs. 175

**** Heads radiate or discoid; branches of the style linear, hairy or hisped at the apex, which is either truncated or produced in a conical or elongated appendage.

* *Heads* radiate; *flowers* yellowish or greenish; sometimes monœcious.

POLYMNIA.—Leaves opposite, large. 176

SILPHIUM.—Heads large, with yellow flowers. 177

AMBROSIA.—Heads monœcious, the fertile at the base, and the sterile at the top of the spikes.—*Coarse weeds, with lobed or dissected leaves, and inconspicuous flowers.* 177

PAGE.

Xanthium.—Fertile and sterile flowers occupying different heads on the same plant; the fertile clustered below; the sterile in short spikes or racemes above.—*Coarse plants.* 178

* * * * * Heads radiate or rarely discoid; the disk flowers always perfect and fertile; receptacle chaffy; anthers blackish, without tails at the base.—*Leaves mostly opposite.*

* *Rays* conspicuous, mostly large.

Heliopsis, p. 179. Rudbeckia, p. 179. Lepachys, p. 180. Helianthus, p. 180.

* * *Rays* yellow, or orange-colored, rarely red, white or purple, or sometimes wanting.

Coreopsis, p. 182. Zinnia, p. 183. Tagetes, p. 184. Actinomeris, p. 184. Bidens, p. 185. Verbesina, p. 186.

† *Pappus composed of several distinct chaffy scales.*

Helenium.—Leaves decurrent on the angled stems.—*Heads terminating the branches.* 186

* * * *Rays* white. *Leaves* much dissected.

Maruta, p. 187. Anthemis, p. 187. Achillea, p. 188. Leucanthemum, p. 188. Pyrethrum, p. 189.

* * * * *Ornamental exotics*, with white, yellow, red and purple rays. *Leaves* lobed.

Chrysanthemum, page 189.

* * * * * *Heads* mostly discoid, fertile or heterogamous; *flowers* yellow or whitish.

† *Leaves bipinnate or finely dissected.*

Tanacetum, p. 189. Artemisia, p. 190.

† † *Leaves entire, white woolly.*

Gnaphalium, p. 191. Antennaria, p. 191. Filago, p. 192.

* * * * * * *Heads* mostly discoid. *Pappus* soft and axillary. *Leaves* mostly alternate. *Flowers* whitish or yellow, rarely scarlet.

Erechthites, p. 192. Cacalia, p. 193. Senicio, p. 194. Arnica, p. 195.

* * * * * * Heads ovoid, discoid, rarely radiate, homogamous (rarely diœcious), heterogamous, with the marginal flowers in a single series.

* *Flowers* mostly purple, blue or whitish, rarely yellowish. *Leaves* often covered with sharp prickles.

Centaurea, p. 195. Cirsium, p. 196. Onopordon, p. 198. Lappa, p. 198. Cnicus, p. 199.

* * *Exotics* with yellow, orange, or rarely white or purplish flowers.

Calendula, p. 199. Carthamus, p. 199. Xeranthemum, p. 200.

† † LIGULIFLORÆ.—Flowers all perfect, with ligulate (strap-shaped) corollas throughout. Page 200.

* Branches of the style slender, obtuse, uniformly hairy. *Herbs, with a milky juice, and alternate leaves.*

* *Flowers* blue, or purplish.

Cichorium, p. 200. Mulgedium, p. 204. Tragopogon, p. 205. Catananche, p. 206.

* * *Flowers* yellow. *Leaves* radical, lyrate, toothed or pinnatifid.

Krigia, p. 201. Cynthia, p. 201. Leontodon, p. 201. Taraxicum, p. 203.

* * * *Flowers* yellow, or rarely whitish or purplish. *Stems* leafy, more or less.

Cynthia, p. 201. Hieracium, p. 202. Nabulus, p. 202. Lactuca, p. 204. Sonchus, p. 205. Tragopogon, p. 205.

ORDER I. MONOGYNIA.—*Flowers separate, not compound.*

PAGE.

VIOLACEÆ,—Flowers polypetalous, irregular. Style club-shaped. 36

IMPATIENS.—Flowers polypetalous, very irregular. Stigma sessile. 64

LOBELIA.—Corolla monopetalous, irregular. Style 1. 206

APOCYNUM.—Corolla monopetalous, regular. Stigma 1. 289

CLASS XIX. GYNANDRIA.—*Stamens situated upon the style or column above the germ.*

ORDERS MONANDRIA and DIANDRIA.

†ORCHIDACEÆ.—Perennial often stemless herbs, with simple parallel-veined entire leaves, and irregular 3-merous flowers. 356

I. Anther single.

* Pollen cohering in definite (4) waxy masses, without any connecting tissue or tail-like prolongation.

† *Plants green and with leaves. Sepals spreading; lip flat.*

1. MICROSTYLIS.—Lip arrow or heart-shaped. Column minute, round. 355

2. LIPARIS.—Lip entire, dilated. Column elongated, margined at the apex. 356

†† *Plants tawny or purplish, nearly leafless.*

3. CORALLORHIZA.—Lip with a spur or projection at the base adherent to the ovary. Anther terminal. 357

4. APLECTRUM.—Lip spurless, free, raised on a claw. Anther rather lateral. 357

** *Pollen* cohering in definite (2 to 4) waxy masses, furnished with an elastic prolongation. *Plants* green.

5. TIPULARIA.—Lip long-spurred underneath.—*Flowers racemed.* 358

*** *Pollen* cohering in very numerous grains which are collected on a cobweb-like tissue into 2 large masses and affixed to the glands of the stigma.

6. ORCHIS.—Anther-cells contiguous and parallel. Glands of the stigma continued in a little pouch formed of a fold or hood of the stigma. 358

7. GYMNADENIA.—Anther-cells contiguous and parallel; glands naked. 359

8. PLATANTHERA.—Anther cells widely seperated at the base: glands naked. 359

*** *Pollen* powdery, in numerous minute and angled loosely cohering grains (forming 2 or 4 masses). Anther terminal, forming a lid over the stigma.

† *Pollen-masses* 4, *angled.*

9. ARETHUSA.—Lip bearded, united at the base to the linear column. 361

†† *Pollen-masses* 2.

10. POGONIA.—Lip more or less crested, free. Column club-shaped. 361

11. CALOPOGON.—Lip bearded, stalked, posterior. Column incurved. 362

††† *Anthers more or less parallel, with the stigma or column erect.*

12. SPIRANTHES.—Lip nearly entire, channelled, pointless, ascending. 362

13. GOODYERA.—Lip entire, inflated sac-like below, strap-pointed. 362

14. LISTERIA.—Lip flat, spreading or pendulous, 2 lobed. 363

II. Anthers 2.

15. CYPRIPEDIUM.—Lip inflated, slipper-form. 363

ORDER V. PENTANDRIA.—5 *Stamens situated upon the Styles.*

ASCLEPIADACEÆ.—Calyx and corolla regular, hypogynous. 290

PAGE.

ORDER VI—XII. HEX-POLYANDRIA.

Aristolochiaceæ.—Calyx epigynous: corolla none. Fruit 7-celled. 297

CLASS XX. MONŒCIA.—*Stamens and Pistils in seperate flowers on the same Plant.*

ORDER I. MONANDRIA.—1 *Stamen.*

Lemna.—Flowers bursting from the side of a floating frond. 348

Zannichellia.—Flowers axillary, sessile; the fertile of 2 to 5-pistils.—*Submersed aquatics.* 350

Euphorbia.—Flowers in a cup shaped involucre. Fertile flower solitary, central, on a long peduncle. Styles 3, usually 2-cleft. Ovary 3-celled. 315

ORDER II—III. DI-TRIANDRIA.—2 *to* 3 *Stamens.*

Podostemum.—Stamens affixed to a common pedicel. Stigmas sessile, recurved. 314

* *Stamens* aggregated in a common spike or head.

Typha.—Flowers all in a spike, intermixed with down. 348

Sparganium.—Flowers in heads, naked, the fertile bracted. 349

** *Stamens* in the axils of bracts.

Carex.—Achenium lenticular or triangular, inclosed in a sac. 403

Scleria.—Achenium globular, crustaceous or bony, naked. 402

Tripsacum.—Grain inclosed in cartilaginous glumes, sunk in the joints of the spike. 420

*** *Staminate flowers* in aments.

Comptonia.—Nutlets 1 under each bract of the burr-like catkin.—*Low shrubs. Leaves pinnatifid.* 327

**** *Staminate flowers* in remote spikes or panicles. *Leaves* parallel-veined.

Zea.—Styles very long, filiform, pendulous. 432

Coix.—Staminate flowers in remote spikes. Style 2-parted. 432

ORDER IV. TETRANDRIA.—4 *or sometimes* 8 *Stamens.*

* *Trees or shrubs. Fertile flowers in aments or spikes.*

Betula.—Stigmas 2. thread-like, becoming a broadly winged and scale-like nutlet or small samara. 327

Alnus.—Sterile aments long and drooping. Scales of the ament thick and woody in fruit, coherent below and persistent. 328

Morus.—Style 2. Achenium ovate, compressed, covered by the succulent berry-like calyx. 335

Broussonetia.—Pistillate aments globose. Ovaries becoming fleshy, club-shaped. Style lateral. 335

Maclura.—Ovaries numerous, forming a compound globose fruit, composed of 1-seeded, compressed, wedge-form carpels. Style 1, filiform. 336

Buxus.—Sterile flowers: calyx 3-leaved. Petals 2. Fertile flowers: calyx 4-sepalled. Petals 3. Styles 3.—*Evergreen shrubs.* 318

* *Herbs.*

Urticaceæ.—Herbs (often stinging) with watery juice, and flowers in spikes, heads or panicles. Style single or none. 337-8

PAGE.

Amaranthus.—Calyx dry and scarious. Styles 2 or 3, filiform. Utricle opening all round, 1-seeded.—*Flowers spike-clustered.* 300

* * *Aquatic herbs.*

Myriophyllum.—Flowers spiked. Stamens 4 or 8. Sepals and petals adherent to the 4-celled nutlet.—*Aquatic herbs.* 117

Eriocaulon.—Sepals and petals free. Capsule 2-celled, 2-seeded. Stigmas 2.—*Leaves linear.* 394

Order V. Pentandria.—5 *Stamens.*

Amaranthus.—Calyx dry and scarious.—*Coarse weedy herbs, with minute spike-clustered flowers.* 300

Order VI. Hexandria.—6 *Stamens.*

Zizania.—Staminate and pistillate flowers in 1-flowered spikelets in the same panicle.—*Large and often Reed-like water-grasses.* 408

Order VII. Polyandria.—*Many Stamens.*

Liquidamber.—Styles 2. Capsule 2-beaked, 2-celled, several-seeded.—*Trees. Leaves deeply 5 to 7-lobed.* 388

Platanus.—Style 1. Nutlets club-shaped, 1-celled, 1-seeded.—*Trees. Leaves palmately-lobed.* 334

* * *Staminate flowers mostly in aments. Trees or shrubs.*

†CUPULIFERÆ.—Trees or shrubs with alternate straight-veined leaves, deciduous stipules, the sterile flowers in aments or clusters, and the fertile solitary or clustered, furnished with an involucre which forms a cup or covering to the 1-celled, 1-seeded nut. 320

* *Fertile flowers* scattered or few in a cluster.

1. Quercus.—Involucre 1-flowered, of many imbricated small scales, forming a cup around the base of the acorn. 320
2. Castanea.—Involucre 2 or 3 flowered, forming a prickly burr, inclosing 1 to 3 leathery nuts, opening by 4 valves. 323
3. Fagus.—Involucre 2-flowered, somewhat prickly, 4-valved, inclosing 2 sharply 3-angled nuts. 324
4. Corylus.—Involucre 1 or 2-flowered, formed of 2 or 3 confluent scales, which become leafy, much enlarged and cut-torn at the apex, inclosing a bony nut. 324

* * *Fertile flowers* clustered in a kind of ament.

5. Carpinus.—Involucre a separate open leaf. 325
6. Ostrya.—Involucre a bladdery bag, 1-flowered. 325

††JUGLANDACEÆ.—Trees with alternate unequally pinnate leaves. Fruit a kind of dry drupe with a bony endocarp (nut-shell), containing a large 4-lobed seed. 318

††† Stamens 12 to many.—*Herbs.*

Ceratophyllum.—Calyx herbaceous. Achenium horned.—*Aquatic herbs, with whorled finely dissected leaves.* 313

Sagittaria.—Sepals and petals 3, free.—*Leaves mostly sagittate. Flowers whitish.* 354

†††† ARACEÆ.—Plants with acrid or pungent juice, simple or compound leaves, and with the flowers crowded on a spadix, usually surrounded by a spathe. Berry 1-celled. 345

* *Spadix* surrounded by a spathe.

1. Arum.—Flowers naked, covering the base only of the spadix. 345

PAGE.

2. PELTANDRA.—Flowers naked covering, the whole spadix; spathe long and convolute. 346

3. CALLA.—Flowers mostly perfect, naked, covering the spadix; spathe open and spreading.—*Leaves heart-shaped long petioled.* 346

ORDER VIII. MONODELPHIA.—*Stamens united by their filaments.*

PHYLLANTHUS.—Stamens 3, much united. Stigmas 6. Capsule 3 lobed, 3-celled, 3 seeded. 317

ACALYPHA.—Stamens 8 to 16, united at the base. Styles 3, cut-fringed. 317

PODOSTEMUM.—Stamens 2, rarely 3. Styles or stigmas 2.—*Aquatics, growing on stems.* 314

RICINUS.—Stamens numerous. Styles 3, 2 parted.—*Herbs, with peltate-palmate leaves,* 318

* *Flowers naked in the axils of scales, forming aments.*

† CONIFERÆ.—Trees or shrubs, with resinous juice, and mostly with evergreen subulate or needle-shaped leaves. 339

1. PINUS.—Leaves in clusters of 2 to 5 in a sheath, persistent. 339

2. ABIES.—Leaves all scattered, persistent. 340

3. LARIX.—Leaves many in a cluster, deciduous. 341

* *Fruit* consisting of a colored strobile or sort of drupe.

4. THUJA.—Fruit of few imbricated oblong scales.—*Leaves scale-like, closely imbricated on the flattened branches.* 342

5. CUPRESSUS.—Fruit of several shield-form thickened scales united in a woody one.—*Leaves scale-like or awl-shaped, appressed.* 342

6. TAXODIUM.—Fruit as in Cupressus.—*Leaves linear, 2-ranked. deciduous.* 343

7. TAXUS.—Ovule erect, encircled at the base by an annular disk, which forms a berry-like cup around the seed.—*Leaves 2-ranked persistent.* 344

ORDER IX. SYNGENESIA.—*Stamens connected by their anthers.*

* *Fruit an achenium.*

XANTHIUM.—Staminate and fertile flowers in seperate involucres, the latter a 2-celled burr. 176

AMBROSIA.—Staminate and fertile flowers in seperate involucres, the latter nut-like, 1-celled. 177

* * *Fruit a fleshy carpel* (Pepo).

CUCURBITACEÆ.—Herbaceous, mostly succulent vines with tendrils, and alternately palmately veined leaves. Fruit a pepo, more or less succulent. 121

1, SICYOS. 2. ECHINOSTYLUS. 3. MELOTHRIA, page 122. 4. MOMORDICA, 5. CUCUMIS, page 123. 6 LAGENARIA. 7. CUCURBITA, page 124.

CLASS XXI. DIŒCIA.—*Stamens and Pistils in seperate flowers and on different plants.*

ORDER I—V. MONO.PENTANDRIA.—*Stamens* 1 *to* 5.

* *Stamens* 1.

NAIAS.—Flowers axillary, sessile, without a perianth.—*Submersed aquatics.* 350

PAGE.

* * *Stamens 2, sometimes 1 to 6.*

Salix.—Sterile and fertile flowers both in aments, naked. Stamens 1 to 6.—*Trees or shrubs.* 328

Fraxinus.—Calyx small, 4-cleft. Style single. Fruit a 1 to 2 seeded samara.—*Trees, with pinnate leaves.* 295

* * * *Stamens 3 or 4.*

Vallisneria.—Capsule cylindrical, 1-celled, many-seeded. Stamens mostly 3. *Submersed aquatics, with long grass-like leaves.* 355

Carex. Achenium in a sac. 403

Viscum.—Anthers sessile on the calyx-lobes. Berry 1-celled, 1-seeded.—*A yellowish green parasitic plant.* 311

* * * * *Stamens mostly 5 (sometimes 4.)*

Negundo.—Fruit a double samara.—*Shrubs. Leaves compound.* 70

Myrica.—Fruit a dry drupe. Flowers in short aments. Filaments 2 to 8, somewhat united.—*Shrubs.* 326

Urtica.—Fruit an achenium. Flowers spiked or panicled.—*Herbs.* 337

Pyrularia.—Style 1. Fruit pear-like, 1-celled, 1-seeded.—*A low straggling shrub.* 310

Nyssa.—Fruit an oval or oblong berry-like drupe, with a grooved endocarp. —*Trees, with smooth and shining leaves.* 303

Cannabineæ.—Calyx of 1 sepal, folding round the achenium.—*Erect or twining herbs, with a watery juice.* 336

Acnida.—Calyx 3 to 5-sepalled. Achenium 3 to 5-angled, crustaceous.—*Herbs. Leaves lanceolate, acuminate.* 299

Xanthoxylum.—Sepals 5, petal-like. Pistils 3 to 5. Carpels thickish, 2-valved. Seeds black and shining.—*Fragrant shrubs.* 66

Ptelea. Petals 3 to 5. Stamens 3 to 5. Stigmas 2. Fruit a 2-celled samara, winged all around.—*Shrubs with 3 to 5-foliate leaves.* 67

Order VI. Hexandria.—6 *Stamens.*

Rumex.—Achenium 3-angular, covered by the inner sepals.—*Sour herbs.* 307

* *Climbing or twining.*

Smilax.—Perianth of 6 equal spreading segments. Stigmas 3, thick. Berry 1 to 3 seeded.—*Shrubs or rarely herbs, climbing by tendrils on the petioles.* 372

Dioscorea.—Capsule 3-celled, 3-winged, 3-seeded.—*Climbing herbs, with more or less heart-shaped leaves.* 371

* * *Herbs, with parallel-veined radical leaves.*

Chamælirium.—Perianth of 6 persistent sepals. Styles 3, linear-club-shaped. Anthers yellow.—*Flowers yellowish-white, in a long slender raceme.* 388

Order VIII. Oct-Polyandria.—8 *to many stamens.*

* *Flowers with calyx and corolla.*

Menispermum.—Sepals and petals 4 to 8, distinct. Drupes 1 to 4.—*Twining or climbing shrubs. Leaves palmate or peltate.* 15

* * *Calyx regular: petals none.*

† LAURACEÆ.—Aromatic trees or shrubs, with alternate leaves. Calyx petal-like, 6-parted. Stamens 9. Drupe free. 307

1. Sassafras.—Drupe ovoid, supported on a fleshy club-shaped pedicel.—*Trees.* 308
2. Benzoin.—Drupe obovoid, the stalk not thickened.—*Shrubs.* 308

* * * *Calyx and corolla none.*

Populus.—Flowers in aments. Stamens 8 to 40. Capsule 1-celled.—*Trees, with more or less heart-shaped leaves.* 332

PAGE.

* * * * *Flowers with a 6-parted perianth.*

Udora.—Spathe bifid, 1-flowered. Stamens 9, 4 of them inferior.—*Submerged Aquatics.* 354

Order X. Monodelphia.—*Stamens united by their filaments.*

* *Flowers in a kind of short ament: ovules naked on the scales. Evergreen trees or shrubs.*

Taxus.—Scales empty at the base of the naked cup shaped berry. 344

Juniperus.—Scales of the fertile aments 3 to 6, forming a sort of drupe. 342

CLASS XXII. POLYGAMIA.

* *Stamens 1 to 3. Flowers glumaceous.*

Gramineæ.—Nos. 45 Andropogon. 42 Panicum. 46 Sorghum.

* * *Stamens 2. Flowers with a calyx or naked.*

Fraxinus.—Fruit a 1 to 2-seeded samara.—*Trees. Leaves pinnate.* 295

Callitriche.—Fruit nut-like, 4-lobed, 4-celled, 4-seeded. 314

* * * *Stamens 3 to 8.*

Chenopodiaceæ.—Calyx herbaceous, inclosing the achenium. 298

Ulmus.—Samara rounded, broadly winged. Calyx 4 to 9-cleft.—*Trees.* 311

Celtis.—Drupe free from the 5 to 6-parted calyx. Styles 2.—*Trees or large shrubs.* 312

Nyssa.—Drupe coherent with the calyx-tube. Style 1.—*Trees, with smooth and shining leaves.* 309

Broussonetia.—Style lateral. Ovaries becoming fleshy, club-shaped, prominent.—*An ornamental exotic tree, with downy entire or lobed leaves.* 335

Gleditschia.—Sepals, petals and stamens 3 to 5.—*Trees, with twice pinnate leaves.* 95

Panax.—Petals and stamens 5. Styles 2 or 3. Fruit a 2 to 3-seeded drupe.—*Herbs, with palmately compound leaves.* 143

Vitis.—Berry 2-celled, 4 seeded. Stamens 4 to 5, opposite the petals.—*Shrubs, climbing by tendrils.* 74

Prinos.—Stamens mostly 6. Corolla rotate, usually 6-parted. Fruit a drupe with 6 smooth nutlets.—*Shrubs.* 222

Nemopanthes.—Calyx a minute ring. Petals 5, oblong-linear. Stamens 5. Stigmas 3 or 4, sessile. Fruit a globose red berry.—*Shrubs.* 223

Ptelea.—Samara winged all round, orbicular, 2-celled.—*Shrubs.* 67

Melanthium.—Stamens 6, on the claws of the 6-parted perianth. Styles 3.—*Leaves parallel-veined.* 388

Veratrum.—Stamens 6. Styles 3.—*Flowers dull colored.* 387

* * * * *Stamens 8 to many.*

Diospyrus.—Berry 4 to 8-celled, 4 to 8-seeded. Stamens 8 and 16.—*Shrubs or trees.* 228

Udora.—Ovary 1-celled. Stamens 9. Spathe 2-cleft, axillary, 1-flowered.—*Submersed aquatics.* 354

FLORA OF PENNSYLVANIA.

SERIES I.

PHÆNOGAMIA, OR FLOWERING PLANTS.

PLANTS composed of cellular tissue, woody fibre, ducts, and spiral vessels, bearing proper flowers, with stamens and pistils, and producing seeds which contain an embryo, radicle and cotyledons.

CLASS 1.—EXOGENS OR DICOTYLEDONS.

STEMS composed of distinct bark and pith with an intervening layer of woody fibre and vessels, increasing in diameter by the annual deposition of new layers between the old wood and the bark, which are arranged in concentric zones and traversed by medullary rays. LEAVES mostly with reticulated veins, and falling off by an articulation. SEPALS and PETALS in *fives* and *fours*, and very rarely in *threes*. EMBRYO with two or more cotyledons.

SUB-CLASS 1.—ANGIOSPERMOUS EXOGENS.

OVULES produced in a closed ovary, and fertilized by the action of pollen through the medium of a stigma. EMBRYO with two cotyledons.

DIVISION 1.—POLYPETALOUS EXOGENS.

Floral envelopes consisting of distinct petals and sepals.

ORDER 1. **RANUNCULACEÆ.**—*Crowfoot Family.*

Herbaceous plants, occasionally climbing—rarely shrubs, with an acrid colorless juice, and usually palmately or ternately lobed or divided leaves, without stipules, alternate, with half-clasping petioles.

CALYX of 3 to 15, (usually 5) distinct, mostly deciduous, sepals. COROLLA, *Petals* 3 to 15 (sometimes irregular or absent,) hypogynous. STAMENS indefinite in number, distinct, rarely few, hypogynous. PISTLIS numerous. FRUIT, either dry pods, or seedlike achenia, or berries, 1 to several seeded. SEEDS solitary or several, anatropous, with a minute embryo and fleshy albumen.

1. CLEMATIS. Linn. VIRGIN'S BOWER.

Gr. *klama*, a tendril; climbing by tendrils, or twining petioles.

CALYX 4 (rarely 5 to 8) sepaled, colored, pubescent. PETALS none, or shorter than the sepals. FILAMENTS numerous. ANTHERS linear. ACHENIA numerous, in a head, bearing the persistent styles in the form of long plumose tails.—*Perennial vines climbing by the leafstalk; stems somewhat woody; leaves mostly compound and opposite.*

1. C. VIRGINIANA, L. *Common Virgin's Bower.*

Stem climbing; *leaves* ternate; *leaflets* cordate, ovate, acute, coarsely toothed or lobed; *flowers* often diœcious, paniculate.

A common hardy climber in hedges and thickets, flowering in July and August. *Flowers* white, numerous, borne in panicles on axillary peduncles. *Sepals* 4, oval, oblong, obtuse. *Fruit* furnished with long plumose feathery tails.

2. C. VIORNA, L. *Leather Flower.*

Stem climbing; *leaves* pinnately divided; segments entire, or 3-lobed, ovate, acute; floral ones entire. *Calyx* companulate; *sepals* very thick and leathery, acuminate, connivent, reflexed at the apex.

Woods; June, July. Stem 10 to 15 feet in length, cylindrical, pubescent, purple, finally shrubby. *Leaves* opposite, pinnately decompound, consisting of 9—12 leaflets. *Flowers* axillary, purple, nodding, on peduncles 3—6 inches long, with a pair of small, simple, entire leaves near the middle. *Fruit* with very plumose tails, from 1—2 inches long.

ATRAGENE, DC., Involucre none: Sepals 4: petals several, minute.

3. C. VERTICILLARIS, DC. *Whorl-leaved Virgin's Bower.*

Stem climbing by the leaf-stalks; *Leaves* in fours, ternate; *Leaflets* stalked, ovate, pointed, entire or a little toothed, sometimes slightly heart-shaped; *Peduncles* 1-flowered; *Sepals* very large, acute.

A handsome climber in highland woods and rocky hills, rare, sometimes cultivated. May, June. *Stem* ascending trees 10—15 feet by means of its twisting petioles. From each of the opposite buds in spring there arise two *ternate leaves* with long, stalked *Leaflets*, and a peduncle which bears a bluish-purple flower. *Sepals* thick 1 inch or more long and nearly ½ wide. *Filaments* about 24, outer ones (petals) dilated, spatulate, tipped with imperfect anthers.

2. ANEMONE. Linn. WIND FLOWER.

Gr. *anemos*, wind; because the flowers are supposed to open when the wind blows.

SEPALS 5 to 15, petal-like, colored. PETALS none. STAMENS numerous, much shorter than the sepals. OVARIES many, free, collected into a roundish or oval head. INVOLUCRE remote from the flower, of 3 divided leaves. ACHE-

NIA mucronate.—*Herbaceous perennials with radical leaves, a 2—3 leaved involucre at the base of the flower-stalks, and whitish flowers.*

1. A. NEMOROSA, L. *Wood Anemone.*

Stem low, simple, smooth, 1-flowered. *Leaves* ternate; *leaflets* undivided, or with the middle-one 3-cleft, and lateral ones 3-parted, incisely dentate, those of the involucre similar, petiolate. *Sepals* oval or elliptical.

Var. *quinquifolia* D C. Lateral leaves of the involucre 2-parted to the base.

Margin of woods. April and May. A delicate vernal species. *Stem* or scape 4—8 inches high. *Flowers* 1 inch in diameter. *Sepals* 4—7, white or purplish. *Carpels* 15—20, oblong, with a hooked beak.

2. A. PENNSYLVANICA, L.

Stem dichotomous; *leaves* 3 to 5 parted; *segments* 3-cleft, lobes oblong, incisely toothed, acuminate: *involucre* 3-leaved; *involucels* 2-leaved, sessile; *sepals* 5, obvate; *carpels* hairy, in a globose head.

Shores and rocky places. June, August. *Stem* 12 to 18 inches high. *Flowers* 1 to 1½ inch in diameter, borne on naked peduncles. *Sepals* white and membranaceous.

3. A. VIRGINIANA, L. *Thimble Weed.*

Leaves ternate; *segments* oval-lanceolate, 3-cleft, acuminate, cut serrate, the lateral 2-parted, those of the involucre similar; *sepals* 5, acute; *peduncles* elongated; *carpels* densely wooly, in an ovoid oblong head.

Woods and meadows; common. June, August. *Stem* 20 to 30 inches high; the upright *peduncles* 6 to 12 inches long. *Flowers* ¾ of an inch in diameter. *Sepals* greenish-white, silky beneath, 2 narrower than the others. *Fruit* woolly, in heads one inch long.

3. HEPATICA. Willd. LIVERLEAF.

Gr. *hepar*, the liver; from a fancied resemblance of its leaves.

INVOLUCRE 3 leaved, simple, resembling a calyx, 1-flowered. SEPALS petaloid 5—9, disposed in 2 or 3 rows. OVARIES many. CARPELS without awns.—*Leaves all radical, heart-shaped and 3-lobed, thickish and persistent through the year; the new ones appearing later than the flowers. Flowers single, on hairy scapes.*

1. H. TRILOBA, Willd. *Liverwort, Liverleaf.*

Leaves cordate, 3 to 5 lobed; lobes entire.

Var. 1. *Obtusa*, Pursh. *Leaves* 3-lobed; roundish, obtuse.

Var. 2. *Acuta*, Pursh. *Leaves* 3 to 5 lobed; lobes spreading, acute.

Woods and rocky places; common. This neat little plant is one of the earliest harbingers of Spring. April and May. Perennial. The root consists of numerous fibres. *Flowers* generally blue, but frequently purplish and white: becoming double by cultivation.

4. THALICTRUM. L. MEADOW RUE.

SEPALS 4 or more, petaloid, greenish, caducous. PETALS none. ACHENIA 4—15 dry tipped by the stigma or short style, grooved or ribbed, or inflated. SEEDS suspended. *Perennials with 2—3-ternately compound leaves; the divisions and the leaflets stalked. Flowers in corymbs or panicles; often polygamous.*

* *Stem-leaves forming an involucre at the summit like Anemone; root tuberous; stamens shorter than the petaloid calyx.*

1. T. ANEMONOIDES, Michx. *Rue Anemone.*

Root tuberous; *radical leaves* biternate; *leaflets* subcordate, 3 toothed; *floral leaves* petioled, resembling an involucre; *flowers* few, in a simple umbel; *petaloid calyx* 8 to 10 leaved. *Anemone thalictroides*, L.

Woods. April and May; common. A pretty plant; the flowers resembling those of *Anemone*, but the fruit that of *Thalictrum*. *Stems* or *scapes* 4 to 8 inches high; often several from one root. *Flowers* white or purplish, 1 inch in diameter. *Sepals* twice as long as the stamens.

** *Stem-leaves scattered*, 3 to 4 *times compound; root fibrous; stamens longer than the sepals.*

2. T. CORNUTI, L. *Meadow Rue.*

Stem-leaves without general petioles, decompound; *leaflets* roundish-obovate or oblong, 3-lobed at the apex, the lobes acutish; glaucous beneath, with the nerves scarcely prominent; *peduncle* longer than the leaves. *Flowers* in very compound large panicles; diœcious or polygamous; *carpels* nearly sessile, acute at each end, strongly ribbed, twice as long as the style.

Wet ground. June and July. *Stem* 3 to 5 feet high, branching. *Leaves* very variable in form, deep green above, paler glaucous smooth or pubescent beneath. *Filaments* slightly club-shaped; *anthers* oblong.

3. T. DIOICUM, L. *Early Meadow Rue.*

Leaves all with general petioles; decompound, very smooth; *leaflets* rounded, and obtusely lobed, glaucous beneath; *flowers* in compound panicles, dioecious or polygamous; *peduncles* as long as the leaves; *carpels* oblong, sessile, strongly ribbed.

Banks of streams. April and May. *Stem* 1 to 2 feet high. *Flowers* white or purplish. *Filaments* much longer than the sepals. *Anthers* yellowish.

4. T. RUGOSUM, Ait. *Rugose-leaved Meadow Rue.*

Leaves superdecompound; *leaflets* prominently veined beneath, cuneate-obovate and ovate-oblong, 3-lobed at apex, the lateral ones often entire; *flowers* mostly diœcious, rather crowded; *filaments* filiform.

Along shaded swampy rivulets; common. June and July. *Stem* 3 to 5 feet high, branching, striate smooth. *Leaves* pinnately decompound. *Flowers* in rather crowded panicles. *Sepals* white, elliptic oblong, small. *Carpels* obovoid-oblong, acute at each end, beaked with the persistent style.

Obs. This may prove to be only a variety of T. Cornuta, to which it bears much general resemblance. Prof. HOOKER considers them not specifically distinct.

5. RANUNCULUS. Linn. CROWFOOT. BUTTERCUP.

Lat. *rana* a *frog;* the aquatic species growing where frogs abound.

SEPALS 5, deciduous. PETALS 5 (rarely 10), with a little scale or nectary at the base inside. STAMENS and ovaries numerous. CARPELS ovate, somewhat compressed, pointed, arranged in a globose or cylindrical head.—*Herbaceous annual or perennial plants. Leaves mostly radical, though cauline at the base. Flowers solitary or somewhat corymbed, yellow, rarely white.*

* *Petals white, claws yellow ; carpels transversely rugose-striate.*

1. R. AQUATILIS, L. *White Water Crowfoot.*

Stem floating, filiform ; *leaves* all submersed, divided into capillary diverging segments ; *petals* obovate, longer than the calyx.

Ponds and flowing water. June—August. Rather rare. *Stem* 1 to 2 feet high, slender, weak, round, smooth, jointed. *Leaves* dichotomously divided into numerous hair-like segments, roundish in outline, and ½ to 1 inch in diameter. *Flowers* small, white or yellowish.

** *Flowers yellow: leaves undivided: carpels smooth, ovate, collected into a roundish head : perennial.*

2. R. FLAMMULA, L. *Spearwort.*

Stem declinate ; *leaves* smooth, linear-lanceolate or ovate-lanceolate, subentire, lower ones petiolate, upper ones nearly sessile ; peduncles opposite to the leaves.

Ditches and swamps. July—Sept. *Stem* 1 to 2 feet long, more or less decumbent, rooting at the lower joints. *Leaves* 3 to 6 inches in length, ½ to 1 inch wide, entire or with a few teeth, thickened at the acute summit. *Flowers* solitary, of a golden yellow color, on peduncles 2 to 3 inches long. Whole plant yellowish green.

3. R. REPTANS, L. *Creeping Crowfoot.*

Stem creeping, slender, jointed ; joints 1-flowered. *Leaves* linear or lanceolate, entire, lower ones tapering into petioles.

Gravelly or muddy banks of rivers and ponds; common. June—August. A slender, delicate species. *Stem* 6 to 12 inches long, round, rooting at the joints. *Leaves* fleshy ½ to 1 inch long, mostly narrow and acute at one end. *Flowers* yellow, small, borne on axillary peduncles. *Fruit* very smooth.

4. R. PUSILLUS, Poir. *Puny Crowfoot.*

Stem slender, erect, or decumbent ; *leaves* petioled ; lower ones ovate, roundish, or subcordate, entire and sparingly toothed ; upper ones linear-lanceolate, obscurely toothed, scarcely petioled ; *pedicels* opposite to the leaves, solitary 1-flowered ; *carpels* smooth, with a minute, blunt point.

Wet grounds. June—August. *Stems* 6 to 12 inches high, branched. *Flowers* small, pale-yellow, on long peduncles. *Petals* 1 to 5, often 3, scarcely longer than the calyx. *Stamens* 5 to 10.

*** *Leaves divided.*

5. R. ABORTIOUS, L. *Small-flowered Crowfoot.*

Smooth ; *stem* simple or branching ; *radical leaves*, petiolate, cordate-orbiculate, crenate, sometimes 3-parted ; *stem-leaves* ternate, 3 to 5 cleft, with linear-oblong nearly entire segments ; *upper ones* sessile ; *sepals* longer than the petals, reflexed ; *carpels* in a globular head, tipped with a very short recurved beak.

Woods and wet grounds. May and June. Per. *Stem* a foot high, simple or branching, smooth. *Leaves* variously dissected, mostly smooth, ½ to 1½ in. in diameter, on petioles 3 to 6 inches long ; lower ones pedate. *Flowers* small, yellow.

6. R. SCELERATUS, L. *Celery-leaved Crowfoot.*

Smooth ; *stem* branched ; *lower leaves* 3-parted, segments lobed, petioled ; *stem-*

leaves 3-lobed, lobes oblong, linear, entire or crenately incised; *sepals* reflexed; *carpels* small, numerous, in cylindrical heads.

Wet ditches. May—August. Per. *Stem* a foot high, thick and hollow. *Flowers* small, numerous, pale yellow. *Head* sometimes an inch in length. *Juice* very acrid.

7. R. REPENS, L. *Creeping Crowfoot.*

Stem branching from the base; *leaves* ternate; *leaflets* wedge-form, 3-lobed incisely dentate; central one petiolate; *peduncles* furrowed; *calyx* pilose, spreading; *petals* obovate, larger than the spreading calyx; *carpels* with a straight point strongly margined.

Moist or shady places. May—August. Per. Very variable in size, commencing to flower by upright stems 1 to 2 feet high, increasing by long runners. *Flowers* middle size, bright yellow. *Petals* often emarginate. *Leaves* hairy on the veins, dark green. *Petioles* long, hairy.

8. R. PENNSYLVANICUS, L. *Pennsylvanian Crowfoot.*

Stem erect, and with the petioles covered with stiff spreading hairs; *leaves* ternate, villous, segments subpetiolate, acutely 3-lobed, incisely serrate; *calyx* reflexed, rather longer than the small petals; *carpels* pointed, with a short straight beak, collected into an oblong head.

Wet places: common. July and August. Per. *Stem* 1 to 3 feet high, usually much branched. *Flowers* small, pale yellow. *Carpels* viscid, nearly allied to the next species, but distinguished by its oblong heads of carpels, shorter style, and much smaller flowers.

9. R. HISPIDUS, Mich. *Hairy Crowfoot.*

Stem erect, branched, and with the *petioles* covered with stiff spreading hairs; *leaves* ternate or 3-parted; *leaflets* or segments acutely lobed; pubescence of the pedicels appressed; *calyx* hairy, at length reflexed; *carpels* in a globose head, margined, compressed, smooth; *style* short and straight.

Wet grounds. June—August. Per. *Stem* 18 inches high, very hairy. *Lower leaves* on long petioles; *upper ones* nearly sessile; *leaflets* nearly all petioled, 3-cleft or 3-parted, alternate at base. *Flowers* numerous, large, bright, yellow.

10. R. RECURVATUS, Poir. *Wood Crowfoot.*

Stem erect and with the petioles clothed with speading hairs; *leaves* 3-parted, hairy; *segments* oval, subincised, the lateral ones 2-lobed; *calyx* reflexed; *petals* lanceolate; *carpels* crowned with a sharp, hooked style.

Shady woods and damp places. May—July. Per. *Stem* 12 to 15 inches high, sparingly branched, often dichotomous at the summit. *Lower leaves* somewhat ovate at base, on petioles 2 to 6 inches long which are sheathing at base; *upper ones* subsessile and 3-parted quite to the base. *Flowers* small, pale yellow, on short peduncles. Whole plant pale green.

11. R. FASCICULARIS, Muhl. *Early Crowfoot.*

Stem erect, branched, clothed with appressed hairs; *leaves* on long petioles, pubescent, pinnately divided, the lobes oblong, obovate, pinnatified; *calyx* villous, spreading, shorter than the petals; *carpels* orbicular, crowned with a slender subulate style, collected into a subglobose head.

Woods and hills. April and May. Per. *Root* a fasicle of fleshy fibres. *Stem* 6 to 12 inches high. *Radical leaves* on petioles 3 to 8 inches long, so divided as to appear almost pinnate; *upper ones* 3-parted, nearly sessile. *Flowers* large; *petals* yellow, cuneate-obovate, with a scale at the base as broad as the transparent claw.

12. R. BULBOSUS. L. *Bulbous Crowfoot.*

Stem erect, hairy, bulbous at the base; *leaves* ternate, or quinate-pinnate; *leaflets* 3 to 5 parted; *segments* trifid or incised; *peduncles* sulcate; *calyx* reflexed, hairy; *carpels* tipped with a very short beak; collected into a very globose head.

Meadows and pastures. Introduced from Europe. May—August. Per. *Stem* 9 to 15 inches high, hollow, thickened at the base into a sort of bulb. *Leaves* appearing as if pinnate. *Petals* deep yellow and shining, 5 to 7 cuneate-obovate, sometimes obcordate. *Flowers* more than an inch broad.

13. R. ACRIS, L. *Buttercups Crowfoot.*

Hairy; *stem* erect; *leaves* 3 to 5 parted; *the divisions* all sessile and 3-cleft or parted; their segments cut into linear or lanceolate crowded lobes; *peduncles* terete, not furrowed; *calyx* spreading, hairy; *petals* obovate, not longer than the spreading calyx; *carpels* roundish, smooth, compressed, terminated by a short, recurved beak.

Meadows and pastures; common. Introduced from Europe. June—Aug. Per. *Stem* 1 to 2 feet high, round, hollow, mostly hairy. *Leaves* 1 to 3 inches in diameter. *Flowers* large, golden yellow, shining; becoming double by cultivation. *Garden Buttercups.*

6. HYDRASTIS. Linn. YELLOW ROOT.

Gr. *hudor*, water; from its growing in moist places.

SEPALS 3, ovate, petaloid, caducous. PETALS none. STAMENS and ovaries numerous. CARPELS berry-like, numerous, aggregated in a globose head, terminated by the style, 1—2 seeded.—*A low perennial herb, sending up in early spring, from a thick and knotted yellow root-stalk, a single radical leaf, and a simple hairy stem which is 2-leaved near the summit, and terminated by a single greenish-white flower.*

1. H. CANADENSIS, L. *Yellow Puccoon, Golden-seal.*

Leaves rounded, 2 to 6 inches wide, palmately 3 to 5 lobed; *lobes* acute, doubly serrate.

Rocks, woods, northern sides of hills; rare. May. Chester Co., *Darl.* Lancaster Co. Abundant along the Alleghenies. *Flower* solitary, on a peduncle about 1 inch long. *Sepals* fleshy, pale rose color. *Fruit* fleshy purplish, about the size of a large raspberry. The root affords a juice of a fine yellow color, used by the Indians for staining skins and clothing.

7. CALTHA. Linn. MARSH MARIGOLD.

Gr. *kalathos*, a basket; in allusion to the form of the flower.

CALYX colored, with 5—10 roundish sepals, resembling petals. PETALS none. STAMENS numerous, shorter than the sepals. PISTILS 5—10 with no style. FOLLICLES compressed, spreading, many seeded.—*Smooth perennials with round and heart-shaped, or kidney-form, large leaves, and showy yellow flowers.*

1 C. PALUSTRIS, L. *Marsh Marigold, Golden Cowslip.*

Stem hollow, furrowed; *leaves* cordate, round, or kidney-shaped, crenate; *flowers* large, pedunculate; *sepals* broad oval.

Swamps and wet meadows; common. April and May. A beautiful plant with large flowers of a golden yellow in all their parts. *Stem* 6 to 10 inches high, erect, somewhat succulent, dichotomously branched above. *Leaves* large and shining. Used as a potherb in Spring.

2. C. FLABELLIFOLIA, Pur. *Fan-leaved Marsh Marigold.*

Stem procumbent, many-flowered; *leaves* dilated-reniform; *lobes* widely spreading, coarsely and acutely toothed; *peduncles*, axillary, solitary-flowered; *sepals* obovate; *capsules* uncinate.

Sand spring on Pokono mountain. Pursh. July and August. *Stem* a foot high. *Flowers* yellow, middle sized. Allied to *C. natans* found in Canada and in Siberia.

8. TROLLIUS. Linn. GLOBE FLOWER.

Germ. *trol* or *trollen*, globular; alluding to the form of the flower.

SEPALS colored 5—10—15, deciduous, petaloid. PETALS 5—25, small, linear, tubular at base. STAMENS numerous, much shorter than the sepals. PISTILS many. FOLLICLES numerous, sub-cylindric, sessile, many-seeded.—*Smooth perennials with palmately parted leaves, and large solitary terminal flowers.*

1. T. LAXUS, Salisb. *American Globe-flower.*

Leaves palmate, deeply cleft, cut dentate; *sepals* 5, oblong, spreading; *petals* 15 to 25, shorter than the stamens, inconspicuous.

Deep swamps and wet grounds; rare. May—July. *Stem* a foot or more high. *Flowers* terminal, large, yellowish, or orange colored. *Follicles* about 10, crowned with the persistent style.

This is the only American species. Probably often mistaken for a species of *Ranunculus*.

9. COPTIS. Salisb. GOLD THREAD.

Gr. *kopto*, to cut; in allusion to the numerous divisions of the leaves.

SEPALS 5—7, colored, petaloid, deciduous. PETALS 5—7 small, cucculate. STAMENS numerous 20—25. PISTILS 3—7, on slender stalks. FOLLICLES 3—7, membranous, 4—8 seeded.—*Low smooth perennial herbs with radical leaves, and a long, slender, creeping rhizoma.*

1. C. TRIFOLIA, Salisb. *Gold thread.*

Leaves 3-foliate; *leaflets* wedge-shaped, obovate, obtuse, toothed or obscurely 3-lobed; *scape* 1-flowered; *petals* much smaller than the sepals.

Swamps and boggy places: common. May—July. *Stem* subterranean, extensively creeping, golden yellow, bitter and tonic. *Leaves* evergreen; *scape* 4 to 6 inches high, slender, bearing a single white, starlike flower.

10. AQUILEGIA. Linn. COLUMBINE.

Lat. *aquila*, an eagle; the spurs or nectaries resembling the claws of that bird

SEPALS 5, regular, colored like the petals. PETALS 5, with a short spreading lip, produced backwards into long, tubular spurs, much longer than the calyx. STAMENS 30—40. PISTILS 5, with slender styles. FOLLICLES 5, erect, many seeded.—*Perennials, with 2-3-ternately compound leaves, the leaflets lobed, Flowers large and showy, terminating the branches, nodding.*

1. A. CANADENSIS, L. *Wild Columbine.*

Smooth; divisions of the leaves 3-parted, rather obtuse, incisely dentate; *sepals* somewhat acute, a little longer than the petals; *spurs* straight; longer than the limb. *Styles* and *stamens* exserted.

A beautiful plant growing in rocky places; common. April—June. *Stem* 1 to 2 feet high, branched above. *Flowers* terminal, nodding, scarlet without and yellow within, 1 to 2 inches long. *Fruit* upright. More delicate and graceful than the cultivated. *A. vulgaris* of Europe.

2. A. VULGARIS. *Common Garden Columbine.*

Stem 1 to 2 feet high, leafy, many flowered; *leaves* nearly smooth, glaucous, biternate; *spurs* incurved. *Flowers* purple; becoming double by cultivation, and varying in color, through all shades from purple to white. June.

11. DELPHINUM. Linn. LARKSPUR.

Gr. *delphin*, a dolphin; from the shape of the upper sepal.

SEPALS 5, irregular, colored; the upper one produced into a spur at the base. PETALS 4, irregular, the upper pair terminating behind in a tubular, necteriferous spur, enclosed in the spur of the calyx, the lower pair with short claws. STAMENS numerous. PISTILS 1—5, mostly 3, forming many seeded follicles in fruit.—*Showy herbs with palmately cut or divided leaves. Flowers in terminal racemes, blue, red, or purple: never yellow.*

1. D. AZUREUM, Mich. *Azure Larkspur.*

Pubescent or nearly smooth. *Stem* erect; *leaves* 3 to 5 parted, many cleft, lobes linear; *racemes* erect; *petals* shorter than the sepals, densely bearded at the apex; *flowers* on short pedicels; *spur* ascending.

Woods and uplands; rare. May. Per. *Stem* 1 to 2 feet high, slender, sometimes softly pubescent. *Flowers* large, blue and whitish.

2. D. EXALTATUM, Ait. *Tall Larkspur.*

Stem erect; *leaves* flat, 3 to 5 cleft beyond the middle; lobes wedgeform, 3-cleft at the apex acuminate; lateral ones often 2-lobed; *raceme* erect; *spur* straight, as long as the calyx; *capsules* 3.

Rich soil: Western parts of the State. June and July. Per. *Stem* 2 to 3 feet high. *Lower leaves* 4 to 5 inches broad. *Flowers* of a brilliant purplish blue, borne on panicled *wand-like* racemes; many-flowered.

3. D. TRICORNE, Mich. *Three-horned Larkspur.*

Leaves deeply 5-parted, divisions 3 to 5 cleft; *segments* linear, acutish: *petals* shorter than the sepals, lower ones 2 cleft, densely bearded inside; *spur* ascending, straight, as long as the calyx; *carpels* 3, spreading in fruit.

Uplands. W. Penn. April and May. Per. *Stem* 6 to 18 inches high. *Leaves* roundish in outline, on long petioles. *Racemes* loose, 6 to 12 flowered. *Flowers* bright blue.

4. D. CONSOLIDA, L. *Common Larkspur.*

Stem erect, smoothish, divaricately branched; *flowers* few, in loose racemes; *pedicels* longer than the bracts; *carpels* smooth. Annual. Native of Europe. July. *Flowers* blue.

5. D. GRANDIFLORUM. *Large-flowered Larkspur.*

Leaves palmate, many parted; lobes linear, distant; *pedicels* longer than the bracts; *petals* shorter than the calyx. A superb perennial species from Siberia. *Flowers* double, or single, in racemes; dark brilliant blue, tinged with purple.

6. D. ELATUM. *Bee Larkspur.*

Leaves downy, 5-lobed; *lobes* cuneate at base, trifid, cut dentate; *spur* inflexed.

Native of Siberia. *Stem* 5 to 6 feet high. *Flowers* blue, and at a distance resembling a bee in form.

12. ACONITUM. Linn. WOLFSBANE.

Gr. *akone,* a cliff or rock; in allusion to its place of growth.

SEPALS 5, very irregular, colored, upper one vaulted, larger than the others. PETALS 5, the 3 lower ones minute, often converted into a sac or short spur at the summit. STYLES 3—5; FOLLICLES 3—5, many seeded.—*Perennials with palmate or digitate leaves, and showy flowers in terminal spikes.*

1. A. UNCINATUM, Linn. *American Monkshead.*

Stem slender, weak, climbing, with diverging branches. *Leaves* palmate or 3 to 5 lobed, with oval-lanceolate, cut dentate divisions; *helmet* obtusely conical, rostrate; *spur* inclined, somewhat spiral.

Mountains and rich shady soils along streams; rare. August. *Stem* 5 to 6 feet long, supporting itself upon adjacent bushes. *Leaves* leathery, dark green, 4 to 5 inches wide. *Flowers* large, purple, 3 or 4 near the summit of each branch.

2. A. RECLINATUM. Gray.

A white flowered species; is doubtless to be found in our mountains.

13. ACTAEA. Linn. BANE-BERRY.

Gr. *akte,* the elder; on account of its resemblance to that plant.

SEPALS 4—5, deciduous. PETALS 4—8, spatulate, unguiculate. STAMENS numerous, dilated above; ANTHERS 2-lobed. PISTILS single; *stigma* sessile, depressed, 2-lobed. FRUIT a many-seeded berry. SEEDS smooth, flattened, and packed horizontally in 2 rows.—*Perennials with ternately divided leaves, and thick terminal racemes of white flowers.*

1. A. RUBRA. Willd. *Red Baneberry.*

Leaves twice and thrice ternate; *raceme* hemispherical; *petals* acute, shorter than the stamens; *pedicels* of the fruit shorter than the peduncle. *Berries* ovoid, oblong, shining red, many-seeded.

Rocky woods. May. *Stem* about 2 feet high. *Leaves* very large when full grown. *Flowers* white. *Berries* red in racemes 3 to 4 inches long; *pedicels* slender, 1 inch long.

2. A. ALBA. Big. *White Baneberry. Cohosh.*

Leaves twice and thrice ternate; *raceme* oblong; *petals* equal to the stamens, truncate at the apex; *pedicels* of the fruit as large as the peduncles. *Berries* few-seeded.

Woods. May. Plants 1 to 2 feet high, bearing 2 compound leaves, and a cluster of white flowers. *Leaflets* 1 to 2 inches long, half as wide. *Raceme* 1 to 3 inches long, 1½ thick, at length purple. *Berries* milk white tipped with red, smaller than in A. *rubra*.

14. CIMICIFUGA. Linn. BUGBANE.

Lat. *cimex*, a bug, and *fugo*, to drive away.

SEPALS 4—5, falling off soon after the flowers expand. PETALS 3—8, spatulate, small, on claws, 2-horned at the apex. STAMENS numerous. PISTILS 1—8, forming dry follicular carpels in fruit; *carpels* 1—8, many seeded. *Style*, short. —*Perennials with ternately divided leaves, and white fetid flowers in long slender racemes.*

1. C. RACEMOSA. Ell. *Black Snakeroot.*

Leaves ternately decompound; *leaflets* ovate-oblong, incisely toothed; *racemes* very long; *petals* 2, forked, slender; *style* 1; *capsule* follicular, dry, dehiscent, ovate.

Rich woods: abundant. July and August. *Stems* 3 to 8 feet high, terminated with long, panicled racemes of white monogynous flowers. *Petals* 4 to 6, small. *Stamens* about 100. *Raceme* plume-like, 6 to 12 inches long. *Root* knotted, medicinal.

2. C. AMERICANA. Michx. *American Bugbane.*

Smooth. *Leaves* triternate, segments ovate, terminal one wedge-form at the base; 3-parted, or 3-cleft and incised; *petals* concave, sessile, 2-lobed, necteriferous at base; *pistils* 3 to 8; *seeds* flat, scaly.

High mountains. August. *Stem* 3 to 6 feet high. *Flowers* smaller than in C. *racemosa*; in a long panicle of racemes. *Follicles* mostly 5, abruptly beaked, 6 to 8 seeded.

15. ZANTHORIZA. Linn. YELLOW ROOT.

Gr. *zanthos*, yellow, and *riza*, a root.

CALYX deciduous, 5-sepaled. PETALS 5, of 2 roundish lobes, raised on a pedicel. STAMENS 5—10. OVARIES 5—15, beaked with the styles, 2-3 ovuled. FOLLICLES membranaceous, compressed, 1 seeded.—*A low plant with shrubby shoots: stem and bark yellow and bitter. Leaves pinnately divided. Flowers polygamous, dull purple, in compound drooping axillary racemes.*

1. Z. APIIFOLIA. L'Her.

Leaves pseudo-pinnate or ternate; *leaflets* 5, sessile, incisely lobed and dentate.

Banks of shady streams in mountainous districts. April and May. Per. *Stems* clustered 1 to 3 feet high. *Racemes* many flowered. *Flowers* purple. *Follicles* spreading ¼ inch long.

16. HELLEBORUS. Adans. HELLEBORE.

Gr. *helien*, to cause death; and *bora*, food; on account of its poisonous properties.

SEPALS 5, persistent, mostly greenish. PETALS 8 to 10, very short, tubular, 2-lipped. STAMENS numerous. STIGMAS 3 to 10, orbicular. FOLLICLES 3 to 10, slightly cohering at the base, many seeded. SEEDS elliptical.—*Perennials, with coriacious, divided leaves, and large, nodding flowers.*

1. H. VIRIDIS. L. *Green Hellebore.*

Smooth; *radical leaves* pedately divided. *Stem leaves* few, palmately parted nearly sessile; *peduncles* often in pairs; *sepals* roundish, ovate, acute. A European plant, naturalized. *Stem* about 1 foot high. *Flowers* large, pale green, appearing in early spring. March and April.

CULTIVATED EXOTICS.

17. PÆONIA. PEONY.

SEPALS 5, unequal, leafy, persistent. PETALS 5. STAMENS numerous, mostly changed to petals by cultivation. OVARIES 2 to 5. STYLE none. STIGMAS double, persistent. FOLLICLES many seeded.—*Perennials with fasciculate roots; biternate leaves; and large, showy, terminal, solitary flowers.*

1. P. OFFICIANALIS. *Common Peony*

Stem erect, herbaceous; *lower leaves* bi-pinnately divided; *leaflets* ovate-lanceolate, variously incised. *Fruit* downy, nearly straight. Native of Switzerland. May and June. This splendid flower has long been cultivated in every part of Europe, and in this country. The *double red* variety is the most common. The *white* is truly beautiful.

2. P. ALBIFLORA. *White-flowered Peony.*

Leaflets elliptic-lanceolate, acute, entire, smooth. *Follicles* recurved, smooth. Native of Tartary. Whole plant dark-shining-green, and smooth. *Flowers* white, fragrant, smaller than the last. *Calyx* brown, with 3 green sessile bracts at base. Varieties numerous, with single and double white and rose-colored flowers.

3. P. MOUTAN. *Chinese Tree Peony.*

Stem shrubby; *leaflets* oblong-ovate, glaucous, and somewhat hairy beneath; *terminal-one* 3-lobed; *ovaries* 5, distinct, surrounded by a very large disk. Native of China. *Stem* 3 to 4 feet high. *Leaves* large, on long stalks. *Flowers* very large, fragrant, and always doubled in cultivation. *Disk* very large.

18. ADONIS. Linn.

SEPALS 5, appressed. PETALS 5—15, with naked claws.

Achenia in a spike, ovate, and pointed with the hardened, persistent style.

A. autumnalis. *Pheasant's Eye.*

Stem branching; *leaves* pinnately parted, with numerous linear segments. *Flowers* crimson, 5 to 8 petaled. *Carpels* crowned with a very short style, and collected into an ovate or sub-cylindrical head. *Annual.*

19. NIGELLA. Linn.

Calyx of 5 sepals, colored. Petals 5, 3-cleft. Styles 5. Capsules 5, follicular, convex.—*Annual European herbs, with leaves in many linear and subulate segments.*

1. N. Damascena. *Fennel Flower.*

Leaves twice and thrice pinnatifid, as finely cut as those of the fennel. *Flowers* in a leafy involucre, terminal, solitary encompassed and overtopped by a circle of leaves divided like the rest, white or pale blue, sometimes double; *anthers* obtuse; *Carpels* 5, smooth, 2-celled, united as far as the ends into an ovoid-globose capsule. A hardy annual of the gardens. June—August.

2. N. sativa. *Nutmeg Flower.*

Stem slightly furrowed, erect, branched. *Leaves* divided as in the last, with the divisions much more linear. *Flowers* naked, terminal on the summits of the branches. *Anthers* obtuse. *Capsule* with hard short points. From Egypt. June—September.

Order 2. **MAGNOLIACEÆ.**

Trees or shrubs with the leafbuds sheathed by membraneous stipules; alternate coriaceous, entire leaves, marked with minute transparent dots, and solitary, large, perfect, showy, often fragrant flowers.

Sepals 3 to 6, deciduous, colored. Petals 3 to 27 in several rows, hypogynous, imbricate in æstivation. Stamens indefinite, distinct, hypogynous, in several rows at the base of the receptacle. Ovaries numerous; *style* short; *stigma* simple. Fruit either dry or succulent, consisting of numerous carpels, arranged upon an elongated axis. Seeds solitary or several, attached to the inner suture of the carpels. Bark aromatic and bitter.

1. MAGNOLIA. Linn.

In honor of *Prof. Magnol*, a French botanist.

Sepals 3, deciduous. Petals 6—12, in concentric series. Stamens indefinite, distinct, with short filaments and long anthers, opening inwards. Pistils aggregated and cohering in a mass, together forming a fleshy and rather woody cone-like fruit; each carpel opening on the back at maturity, from which the seeds are suspended, when mature, by a long slender funiculus.—*A magnificent genus, consisting mostly of large trees, with luxuriant foliage, and large fragrant flowers.*

1. M. GLAUCA, L. *Swamp Laurel. Sweet Bay.*

Leaves oval, glaucous beneath, petiolate; *flowers* 9 to 12-petaled; *petals* obovate, tapering to the base; *cone* of *fruit* small, oblong.

Swampy places: southern parts of the State. July and August. A shrub or tree 10 to 20 feet high, with a smooth whitish bark. *Flowers* terminal, on thick peduncles, white, 2 to 3 inches broad, very fragrant. *Leaves* very pale beneath.

2. M. ACUMINATA, L. *Cucumber Tree.*

Leaves deciduous, oval, acuminate, pubescent beneath; *petals* 6 to 9, oblong, somewhat obtuse; *cone* of *fruit* small, cylindrical.

Rich damp woods. June and July. A noble forest tree 60 to 90 feet high, perfectly straight. *Leaves* thin, 5 to 10 inches long. *Flowers* 5 to 6 inches in diameter, bluish, or yellowish-white, glaucous externally. *Cones* of *fruit* 2 to 3 inches long, when green resembling a young cucumber.

3. M. UMBRELLA, Lam. *Umbrella Tree.*

Leaves deciduous, cuneate-lanceolate, acute, silky when young; *sepals* 3, reflexed; *petals* 9, oval-lanceolate, acute, the outer ones reflected; *cone* of *fruit* large, conical, oblong.

Mountain woods; rare. May and June. A small tree with irregular branches. *Leaves* 16 to 20 by 6 to 8 inches; often appearing whorled at the apex of the flowering branches, in the form of an umbrella. *Flowers* terminal, white, 7 to 8 inches in diameter. *Fruit* 4 to 5 inches long, of a fine rose color when ripe.

4. M. FRAZERII, Walt. *Frazer's Magnolia.*

Leaves deciduous, spatulate-obovate, auriculate at the base; *sepals* 3 spreading; *petals* 9, oblong attenuate at the base.

Allegheny mountains, head waters of the Susquehanna, (Pursh); rare. April and May. A fine tree 30 to 40 feet high. *Leaves* 8 to 12 inches long, mostly green and smooth on both sides, or slightly glaucous beneath, somewhat rhomboid; auricle narrow, rounded. *Flowers* about 4 inches in diameter, pale greenish-white. *Fruit* oval-oblong, rose-colored. Torr. & Gray.

2. LIRIODENDRON, Linn. TULIP TREE.

Gr. *leirion*, a lily; *dendron* a tree.

SEPALS 3, caducous. PETALS 6, in 2 rows, making a bell-shaped corolla. CARPELS imbricated in a cone, 1 to 2 seeded; *seeds* attenuated at apex in a scale.—*Large trees with showy and fragrant flowers.*

1. L. TULIPIFERA, L. *Tulip Poplar.*

Leaves alternate, 3 lobed, (the middle lobe truncate); *flowers* large, solitary, with 2 large caducous bracts at the base; *sepals* obovate-oblong, spreading, and at length falling off; *petals* lance-obovate.

Woods throughout the State. June and July. One of the largest trees of our forests; 50 to 100 feet high, from 2 to 3 feet in diameter. *Leaves* dark green, smooth, on long petioles. *Flowers* 4 to 6 inches in diameter, greenish yellow, stained with reddish orange below the middle. There are two varieties: one called *Yellow Poplar*, which is highly valued for cabinet use; *Hickory Poplar*, which is distinguished from the other by its less furrowed bark and tougher, whitish wood.

ORDER 3. ANONACEÆ.

Trees or shrubs with naked buds and no stipules; alternate, entire, simple-feather-veined leaves, large, solitary, axillary, green or brown flowers, and an acrid aromatic fetid bark.

SEPALS 3 to 4, persistent, usually partly cohering. PETALS 6, in 2 rows, valvate, hypogynous coriaceous. STAMENS indefinite, densely crowded, covering a large hypogynous disk; *filaments* short; *anthers* adnate. OVARIES numerous, closely packed; *styles* short; *stigma* simple. FRUIT dry or succulent, consisting of a number of carpels in a mass, sometimes fleshy or pulpy. SEEDS anatropous.

ASIMINA, *Adans.* PAPAW.

Name from *Asiminier*, of the French colonists.

SEPALS 3, united at the base. PETALS 6, in 2 rows, spreading, ovate-oblong; inner ones smallest. STAMENS numerous in a globular mass. PISTILS few, forming large and oblong pulpy several-seeded fruits.—*Shrubs or small trees, with alternate entire leaves emitting an unpleasant odor when bruised, and dull colored axillary and solitary flowers.*

1. A. TRILOBA. *Torr & Gr.* *Papaw.* *Custard Apple.*

Leaves oblong, crenate, acuminate, and with the branches smoothish; *flowers* on short peduncles; *outer petals* roundish-ovate, 3 or 4, as long as the calyx.

Banks of streams. Along the Susquehanna. April and May. A small tree, 10 to 20 feet high. *Flowers* solitary, lateral, appearing in advance of the leaves, dark brownish purple, 1 to 2 inches wide. *Fruit* about 1 inch thick, and 3 inches long, ovoid-oblong, 8-seeded, yellowish, fragrant, eatable, ripe in October.

ORDER 4. **MENISPERMACEÆ.**

Shrubs twining or climbing, with palmate or peltate, alternate, entire, simple leaves; having small, usually polygamo-diœcious flowers in panicles or racemes; sepals and petals confounded in one or several rows, each of which is composed of 3 or 4 parts; deciduous.

STAMENS distinct or monodelphous, equal to the number of the petals and opposite to them; or 3 or 4 times as many. ANTHERS adnate. OVARIES usually-solitary, sometimes 2 to 4 each with one style, distinct, or rarely united. FRUIT a drupe, globose-reniform. SEEDS bent into a crescent or ring; *embryo* curved like the seed; *albumen* sparing.

MENISPERMUM. Linn. MOONSEED.

Gr. *mene*, the moon; *sperma*, seed; from the crescent form of the seed.

SEPALS and PETALS arranged in fours, 2 or 3 rowed. STERILE FL. STAMENS 12 to 20. FERTILE FL. pistils 2 to 4. DRUPE berried, roundish, reniform, with a single lunate nut or seed.—*Sterile* and *fertile flowers* often dissimilar.

1. M. CANADENSE, L. *Moonseed.*

Stem climbing; *leaves* peltate, the petioles inserted near the base, roundish cordate, obtusely angled, mucronate; *panicles* axillary; *petals* 4 to 8 small.

Banks of streams. July. Root Per. *Stem* round, 8 to 12 feet long. *Leaves* 4 to 5 inches in diameter, generally 5 angled, smooth. pale beneath, on petioles 3 to 5 inches long. *Flowers* in axillary clusters, small, yellow, tinged with purple. *Berries* black, resembling grapes.

Var. *lobatum*, has the leaves lobed.

ORDER 5. BERBERIDACEÆ.

Herbs or shrubs with alternate leaves, exstipulate, simple or compound; with solitary, racemose, or panicled flowers. SEPALS 3 to 6, imbricated in 2 rows. COROLLA hypogynous. PETALS 1 to 3 times as many as the sepals, and opposite to them. STAMENS as many or twice as many as the petals, and opposite to them. OVARY solitary, 1-celled, simple; *style* rather lateral; *stigma* orbicular. FRUIT a berry or capsule. SEEDS one or few, attached to the bottom of the cell, or many attached to a lateral placentæ.

1. BERBERIS, Linn. BARBERRY.

Arabic *Berberis;* name of the fruit.

SEPALS 6, mostly with bracteoles at the base. PETALS 6 with 2-glands upon their claws. STAMENS 6; *filaments* flattened; *anthers* 2-lobed; *lobes* on opposite edges of the connectile style. STIGMA circular, depressed. FRUIT a 1 to 3 seeded berry. SEEDS erect, with a crustaceous integument. —*Fine hardy shrubs, with yellow wood and inner bark.*

1. B. CANADENSIS, Pursh. *American Barberry.*

Branches verrucose-dotted, with short triple spines; *leaves* spatulate-oblong, remotely serrate with somewhat bristly teeth; *racemes* sub-corymbose, four-flowered; *petals* emarginate; *berries* sub-globose or oval.

Allegheny mountains. May. *Leaves* alternate at base but nearly sessile, margin serrulate with 6 to 8 distant mucronate teeth. *Racemes* 5 to 8 flowered, nodding. *Flowers* and fruit as well as the leaves smaller than in B. vulgaris.

2. B. VULGARIS, L. *Common Barberry.*

Leaves scattered on the young shoots of the season, mostly small, and with sharp-lobed margins, or reduced to sharp triple spines; simple, closely serrate, with bristly teeth; *racemes* many-flowered, pendulous; *petals* entire; *berries* oblong.

Roadsides and fields. Native of Europe, naturalized. April and May. A shrub 4 to 6 feet high. *Leaves* alternate, 1½ to 2 inches long, ⅓ as wide. *Flowers* in pendulous racemes, pale yellow. *Stamens* irritable, springing violently against the stigma when touched. *Berries* red, very acid. The bark of the root dyes yellow.

2. PODOPHYLLUM. Linn. MAY APPLE.

Gr. *pous,* a foot; and *phullon* a leaf; the leaf resembling a web-foot.

SEPALS 3, oval, obtuse, caducous. PETALS 6 to 9, obovate, concave. STAMENS 9 to 18, with linear anthers. STIGMA large, sub-sessile, peltate, persistent. BERRY large, ovoid, 1-celled, somewhat fleshy, not dehiscent. SEEDS numerous.—*Low perennial plants, with creeping rootstalks, and thick fibrous roots.*

1. P. PELLATUM, L. *May Apple. Wild Mandrake.*

Flowering stem erect, 2-parted, bearing 2 1-sided leaves, with the stalk fixed near the inner edge, palmately lobed; *flowerless stems* terminated by a large, round, 7 to 9 lobed leaf, peltate in the middle like an *umbrella; flower* solitary, in the fork of the petiole, pendulous.

Woods: common. May. *Stem* a foot high. *Flower* white, 2 inches in diameter. *Fruit* ovoid, 1 to 2 inches long; ripe in July; yellow, with the flavor of the strawberry.

3. JEFFERSONIA. Bart. TWIN-LEAF.

In honor of *Thomas Jefferson.*

SEPALS 4, colored, deciduous. PETALS 8, spreading, incurved. STAMENS 8, with linear anthers. STIGMA peltate. CAPSULES obovate, stipitate, semicircularly dehiscent. SEEDS many, arillate at the base.—*Perennial smooth plants with matted fibrous roots, and simple naked, 1-flowered scapes.*

1. J. DIPHYLLA, Barton. *Twin-leaf.*

Scape 8 to 14 inches high; *leaf* binate, petioled; *flower* terminal, solitary; *capsule* large, coriaceous; *seeds* shining, oblong.

A singular plant, flowering in May: not common. *Rhizoma* horizontal. *Petioles* radical, bearing at the top a pair of binate leaves, placed base to base, and broader than they are long, ending in an obtuse point; glaucus beneath. *Scape* as long as the petioles. *Flowers* large, white. *Capsule* opening, half round, with a persistent lid.

4. LEONTICE. Linn. LION'S FOOT.

Gr. *leon*, a lion; the leaf resembling in outline a lion's foot.

SEPALS 6, naked without. PETALS 6, bearing a scale at the base within. STAMENS 6, opposite the petals. PISTILS gibbous. STYLE short. STIGMA minute. OVARY bursting at an early stage by the pressure of the 2-erect enlarging seeds, soon withering away; the spherical seeds naked on their thick seedstalk, looking like drupes; the fleshy integument blue, the solid albumen horny.

1. L. THALICTROIDES, L. *Puppoose-root. Blue Cohosh.*

Smooth; *lower leaf* triternate; *upper one* biternate; *leaflets* oblong ovate, and cuneate-obovate, mostly 3-lobed at the apex; *flowers* paniculate; *peduncle* from the base of the upper petioles.

Rocky woods. May. Per. *Stem* 1 to 2 feet high, round, 2-parted, one of which is a 3-ternate leaf-stalk, the other bears a 2-ternate leaf and a racemose panicle of greenish flowers.

ORDER 6. CABOMBACEÆ.

Aquatic plants with floating, entire, centrally peltate leaves; and solitary, axillary flowers. SEPALS 3 to 4, colored inside. PETALS 3 to 4, alternate with the sepals. STAMENS definite or indefinite; ANTHERS innate. PISTILS 4 to 18, forming little club-shaped indehiscent pods, tipped with the indurated style; STIGMA simple. SEEDS globular pendulous.

BRASENIA. Schreber. WATER SHIELDS.

CALYX of 3 to 4 sepals. PETALS 3 to 4. STAMENS 18 to 36. CARPELS oblong, acuminate, 1 to 2 seeded. *Perennial herbs.*

1. B. PELTATA, Pursh. *Water Shield. Water Target.*

Leaves alternate, long petioled, centrally peltate, oval, floating on the water, smooth and shining above; *flowers* on long, slender, axillary peduncles, floating on the surface.

Lakes and ponds. Often in company with the white water-lily. June and July. Whole plant covered with a viscid jelly. *Flowers* purple, one inch in diameter.

ORDER 7. **NELUMBIACEÆ.**—WATER BEANS.

Aquatic herbs with peltate, fleshy radical leaves, arising from a prostrate rhizoma. FLOWERS large, solitary, on long erect scapes. SEPALS 4 to 5. PETALS numerous, oblong, in many rows. STAMENS numerous, arising from within the petals, in several rows; FILAMENTS petaloid; ANTHERS adnate. PISTILS distinct, numerous, forming acorn-shaped nuts, and separately imbedded in cavities of the enlarged top-shaped receptacle. SEEDS solitary, filled with the large, highly developed embryo.

NELUMBIUM. Juss. SACRED BEAN.

From the Ceylonese name, *Nelumbo.*

CALYX petaloid, of 4 to 6 sepals. PETALS numerous. CARPELS numerous. SEEDS large, round, solitary.—*Perennials.*

1. N. LUTEUM, Willd. *Water Chinquipin.*

Leaves orbicular, alternate, centrally peltate, very entire; *anthers* with a linear appendage.

Rivers and stagnant waters: abundant in the ditches of meadows bordering the Delaware, below Philadelphia. June. *Leaves* a foot, or more, in diameter. *Peduncles* very long, more or less scabrous. *Flowers* 5 to 10 inches in diameter, yellowish-white. *Seeds* catable.

ORDER 8. **NYMPHÆACEÆ.**—*Water Lilies.*

Aquatic herbs, with round or peltate floating leaves, and solitary showy flowers from a prostrate root-stalk. SEPALS and PETALS numerous, imbricated, gradually passing into each other. SEPALS persistent. PETALS inserted upon the disk surrounding the pistil. STAMENS numerous, inserted above the petals into the disk; FILAMENTS petaloid; ANTHERS adnate. DISK large, fleshy, surrounding the ovary more or less. OVARY with radiating stigmas. FRUIT many-celled, indehiscent: SEEDS numerous, attached to the spongy placentæ and enveloped in a gelatinous aril.

1. NYMPHÆA. Linn. WATER LILY.

Dedicated by the Greeks to the Water Nymph.

SEPALS 4, at the base of the disk. PETALS numerous, inserted on the torus at its base. STAMENS numerous, gradually transformed into petals. STIGMA surrounded with rays. PERICARP many celled, many seeded, depressed, globular, covered with the bases of the decayed petals.—*Perennials with showy white, rose-colored, or blue flowers.*

1. N. ODORATA, Ait. *White Pond-Lily.*

Leaves floating, orbicular-cordate, very entire; nerves and veins prominent; *stigma* 16 to 30 rayed; *rays* incurved.

Ponds and sluggish streams. Susquehanna. June, July. One of the lovliest of flowers; possessing beauty, delicacy and fragrance in the highest degree. *Rhizoma* thick, in mud where the water is from 1 to 5 feet in depth, sending up leaves and flowers to the surface. *Leaves* 4 to 6 inches in diameter, dark shining green above, cleft at the base quite to the insertion of the petiole. *Sepals* colored within. *Petals* very delicate. 1 to 2 inches long, white tinged with purple. *Filaments* yellow. *Flowers* 3 to 4 inches in diameter, very fragrant.

2. NUPHAR. Smith. YELLOW WATER LILY.

SEPALS 5 or 6, oblong, concave, colored within. PETALS numerous, small and stamen-like; compactly inserted with the stamens into an enlargement of the receptacle at the base of the ovary. STIGMA discoid, with prominent rays. PERICARP many-celled, many-seeded.—*Perennials, with yellow flowers, and floating leaves.*

1. N. ADVENA, Ait. *Yellow Pond-Lily. Spatter Dock.*

Leaves erect or floating, on half cylindrical petioles, heart-shaped at the base, oblong, or rounded; *sepals* 6; *petals* numerous, small; *stigma* 15 to 20 rayed; *fruit* furrowed.

Ponds and ditches; mostly in shallow water: common. June—August. *Leaves* large dark green, shining above. *Flowers* rather large and globular in form, erect, on a thick rigid stalk. Three outer sepals, yellow inside; three inner, entirely yellow, as well as the petals and stamens.

2. N. LUTEA, Smith. *Small flowered Yellow Water-Lily.*

Leaves floating, cordate, oval; *lobes* approximate; *petioles* 3-sided, acute angled; *stigma* 16 to 20 rayed.

Ponds: common. June. *Sepals* very obtuse. *Petals* much smaller, truncate. Confounded by some of our botanists with the next species.

3. KALMIANA, Ait. *Kalms Water-Lily.*

Leaves cordate, submersed, with approximate lobes; *petioles* terete; *calyx* 5-leaved; *stigmas* incised, 8 to 12 rayed.

In Water. July, Aug. *Leaves* and *flowers* small; *upper leaves* 2 to 3 inches long, 1½ to 3½ inches wide: *lower leaves* 3 to 4 inches in diameter. Dr. Robbins. Beck. Gray considers it a variety of *N. Lutea;* to which it is certainly closely allied.

ORDER 9. SARRACENIACÆ.—*Pitcher Plants.*

Herbaceous plants growing in boggy places, with hollow pitcher form, or trumpet-shaped radical leaves; with the petiole and lamina articulated at the summit. Characteristics, those of the typical *genus.*

1. SARRACENIA, *Tourn.*

In honor of *Dr. Sarrazin*, of Quebec.

CALYX of 5 sepals, with 3 small bractlets at the base; colored, persistent. PETALS 5, oblong or obovate, incurved, deciduous. STAMENS numerous, hypogynous. STIGMA very large, peltate, persistent, covering the ovary and stamens, in the form of an umbrella, petal-like, 5 angled, 5 rayed; the 5 delicate rays terminating under the angles in as many hooks. CAPSULE 5-celled, 5-valved, many seeded.—*Perennials, yellowish, green and purplish. Flowers large, solitary on scapes.*

1. S. PURPUREA, L. *Side-saddle Flower. Huntsman's Cup.*

Leaves (ascidia) pitcher-shaped, inflated, contracted at the mouth, curved, ascending, broadly winged on the inner, (or upper) side; *hood* erect, open, round, heart-shaped.

Sphagnous swamps. Bear Meadows, Centre Co. Blackhole Valley, Lycoming Co. June, July. A singular plant bearing curious pitcher-shaped leaves, from 6 to 9 inches long, hollow, swelling in the middle, with a wing-like appendage extending the whole length inside, ½ to 1 inch wide, and extended on the outside of the mouth into a kind of a blade, covered above with reversed hairs; usually half filled with water and drowned insects. *Scape* 14 to 20 inches high, terete, smooth, supporting a single, large, purple, nodding flower, which is almost as curious in its structure as the leaves.

ORDER 10. PAPAVERACEÆ.

Herbs with milky or colored juice, alternate, simple or divided leaves, without stipules; and regular flowers with fugacious sepals; polyandrous, hypogynous; having a 1-celled pod with 2 or more parietal placentæ. FLOWERS solitary, on long peduncles, never blue. SEPALS 2, rarely 3, falling off when the flower expands. PETALS 4 to 12, spreading, imbricate in the bud, deciduous. STAMENS numerous, 16 or more, distinct, rarely polydelphous. OVARY solitary; *style* short; *stigmas* 2, or if more, stellate upon the flat apex of the ovary. FRUIT either pod-shaped or capsular.

1. SANGUINARIA. Linn. BLOODROOT.

Lat. *sanguis,* blood: in allusion to the color of its juice.

SEPALS 2, caducous. PETALS 8 to 12, in 2 series, spatulate-oblong, the inner narrower. STAMENS about 24. STYLE short; *stigma* 2-lobed or connate. CAPSULE pod-like, oblong, 1-celled, 2-valved, ventricose; *valves* deciduous: SEEDS numerous, with a large crest.—*A low perenial with thick prostrate rootstocks filled with a red-orange acrid juice.*

1. S. CANADENSIS, L. *Blood-root. Red Puccoon.*

Leaves radical, reniform or cordate, with roundish lobes, separated by roundish sinuses.

Open woods and rocky places: common. April, May. A smooth pretty plant sending up in early spring a scape about 6 inches high, with a single white flower appearing in advance of the single large glaucous leaf. *Flowers* quadrangular in outline, scentless, and of short duration.

2. MECONOPSIS, DC.

Gr. *mekon,* a poppy; and *opsis,* appearance: resembling the poppy.

SEPALS 2, hairy. PETALS 4. STAMENS many. STYLE short, distinct; STIGMAS 4 to 6, radiating, convex, free. CAPSULES obovate, 1-celled, opening by 4 valves at the apex.—*Perennial herbs with a yellow juice and pinnatified or pinnately divided leaves.*

M. DIPHYLLUM, DC. *Celendine Poppy.*

Leaves pinnately divided, glaucous beneath; segments 5 to 7, ovate-oblong, sinuate; *stem leaves* 2, opposite, petiolate; *pedicels* aggregated, terminal; *capsule* 4-valved, echinate.

Woods. Alleghany mountains. May. *Stem* a foot high. *Leaves* large, 8 by 6 inches, on petioles about the same length. *Peduncles* about 3 inches long, 1-flowered. *Flowers* deep yellow, 2 inches broad.

3. ARGEMONE. Linn.

Gr. *argema*, a disease of the eye, which this plant was supposed to cure.

SEPALS 3, roundish, acuminate. PETALS 4 to 6. STAMENS many. STYLE scarcely any: *stigmas* 3 to 6, radiate; CAPSULE ob-ovoid, opening at the top by valves.—*Herbs with prickly bristles and yellow juice. Annual or biennial.*

A. MEXICANA, L. *Horn Poppy.*

Leaves repand-sinuate or pinnatifid, with spiny teeth; *flowers* solitary, erect, axillary; *calyx* prickly; *capsules* prickly, 6-valved.

Banks of streams. June, July. *Stem* 1 to 3 feet high, branching, armed with prickly spines. *Leaves* sessile, 5 to 8 inches long. *Flowers* yellow, about 2 inches in diameter. Probably introduced.

4. CHELIDONIUM. Linn. CELENDINE.

Gr. *chelidon* a swallow: flowering about the time when swallows appear.

SEPALS 2, glabrous. PETALS 4, suborbicular, contracted at the base: STAMENS numerous 24 to 32, shorter than the petals. STIGMA 2-lobed. CAPSULE silique-form, slender, smooth, 2-valved, the valves opening from the bottom: *Seeds* several, crested.—*Perennial herbs, with brittle stems, and acrid yellow juice.*

C. MAJUS, L. *Common Celendine.*

Leaves pseudo-pinnate, glaucous; segments ovate, crenate lobed; *pedicels* somewhat umbellate; *petals* elliptic, entire, flowers in umbels.

A pale green juicy plant growing in waste places. Introduced from Europe. Naturalized. May—Aug. *Stem* 1 to 2 feet high, branched. *Flowers* yellow, very fugacious, borne in thin axillary, pedunculate umbels.

5. PAPAVER. Linn. POPPY.

Celtic *papa, pap;* being added to the food of children to induce sleep.

SEPALS 2, concave, caducous. PETALS 4. STAMENS many.

Stigmas sessile, united in a flat, 4 to 20, radiated crown, resting on the summit of the ovary and capsule. Capsule obovoid, 1-celled, opening by minute valves under the margin of the stigma.—*Exotic herbs, mostly biennial, with a white juice abounding with opium.*

1. P. dubium, L. *Field or Corn Poppy.*

Leaves pseudo-pinnate; segments lance-oblong, pinnatifidly incised, sessile, decurrent; *Stem* hispid with spreading hairs; *peduncles* with appressed bristly hairs; *sepals* hairy; *capsule* obovoid-oblong, smooth.

Sparingly naturalized in cultivated grounds. June and July. *Stem* about 2 feet high. *Flowers* light red or scarlet. Native of Europe.

2. P. somniferum, L. *Common Poppy.*

Smooth and glaucous; *leaves* clasping, incised, and dentate, wavy; *sepals* smooth; *capsule* globose. Native of Persia. Common in cultivation. Scarcely naturalized. *Stem* 1 to 3 feet high; *Leaves* 4 to 8 by 2 to 3 inches, with rather obtuse dentures. *Flowers* large brilliant white, red and purple: sometimes very double.

3. P. Rheas. *Common Red Poppy.*

Stem many-flowered, hairy; *leaves* incisely pinnatifid; *capsules* smooth, nearly globose. Distinguished from the last species chiefly by its more finely divided leaves and globular capsules. *Flowers* very large and showy, of a deep scarlet red, sometimes variable. Cultivated.

6. ESCHSCHOLTZIA.

In honor of *Eschscholtz*, a German botanist, known by his researches in California

Sepals 2, cohering by their edge, caducous. Petals 4. Stamens many, adhering to the claws of the petals. Stigmas 4 to 7, sessile, 2 to 3 of them abortive. Capsules pod-shaped, cylindric 10-striate, many seeded.—*Annual, glaucous herbs with a colorless juice, 2 to 3 pinnatifid leaves with linear segments, and showy yellow flowers on solitary peduncles.*

E. Douglasii, Hook. *California Poppy.*

Stem branching, leafy; *torus* obconic: *calyx* ovoid, with a very short abrupt acumination. *Petals* bright yellow, with an orange spot at the base. 2 inches broad. Native of California and Oregon. Common in cultivation.

2. E. Californica, Hook.

Stem branching, leafy; *torus* funnel-form with a much dilated limb; *calyx* obconic, with a long acumination; *flowers* orange-yellow. From California. Cultivated.

Order 11. **FUMARIACEÆ.**

Delicate smooth herbs, with watery juice, compound dissected leaves, and irregular flowers. Flowers irregular, purple, white, or yellow. Sepals 2, deciduous. Petals 4, cruciate, hypogynous, very irregular. Stamens 6, in two sets of 3 each, placed opposite the larger petals, hypogynous, their filaments more or less united; the middle anther of each 1-celled: the lateral ones 2-celled. OVARY superior, 1-celled; STYLE filiform; STIGMA with 2 or more points.

DICENTRA. *Bork.* Wrongly *Diclytra* or *Dielytra.*

Gr. *dis,* twice; and *kentron,* a spur: in allusion to the two spurs.

SEPALS 2, small. PETALS 4; the two outer equally spurred, or gibbous at the base. STAMENS united in 2 sets of 3 in each. STIGMA 2-crested or 2 horned. FILAMENTS slightly united. POD 2-valved, 10 to 20 seeded.—*Low stemless perennials; with ternately compound leaves, and simple scapes, bearing racemose nodding flowers.*

1. D. CUCCULARIA, DC. *Dutchman's Breeches.*

Root bulbiferous; *scape* naked; *raceme* simple, 1-sided, 4 to 10 flowered; *wing* of the inner petals short; *spurs* divergent, elongated, acute, straight; *pedicels* 2-bracted.

Rich woods, shady ravines and hills. April and May. A smooth handsome plant. *Bulbs* consisting of clusters of little grainlike tubers inclosed in a sheath. *Leaves* radical, multifid, somewhat triternate, smooth, with oblong linear segments. *Scape* slender, 6 to 10 inches high. *Flowers* scentless, nodding, white, tinged with yellow and purple.

2. D. CANADENSE, DC. *Squirrel Corn.*

, *Scape* naked; *raceme* simple, 4 to 6 flowered; *spurs* short, rounded; wing of the inner petals projecting beyond the summit.

Rich woods. May. *Rhizoma* bearing a number of roundish tubers, about the size of peas, and of a bright yellow color. *Leaves* having the segments longer and narrower than in the preceding species. *Flowers* white, tinged with purple, very fragrant, 3 to 4 on a scape 6 to 8 inches high.

3. D. EXIMIA, DC. *Choice Dicentra.*

Divisions and lobes of the leaves broadly oblong; *scape* naked; *raceme* compound, clustered; *corolla* oblong, 2-gibbous at the base, crest of the inner petals projecting beyond the summit.

Rocks, along the Alleghanies. April—July. A larger plant than the others, blossoming all summer. *Leaves* 10 to 15 inches high, with 4 to 8 cymes, each with 7 to 10 reddish-purple, nodding flowers. Often cultivated.

2. CORYDALIS, DC.

From *korudalis;* the Greek name of *Fumitory.*

SEPALS 2, small. PETALS 4, one of which is spurred at the base, deciduous. STAMENS 6, diadelphous: filaments in 2 equal sets by their broad bases which sheath the ovary. POD 2-valved, many-seeded. SEEDS crested.—*Flowers in racemes. Biennials.*

1. C. AUREA, Willd. *Golden Corydalis.*

Stem branched, diffuse; *leaves* glaucous, doubly pinnate, lobes oblong-linear, acute; *bracts* lanceolate or ovate, acuminate, toothed, opposite the leaves, and terminal; *spur* incurved, *pods* terete, pendant: *seeds* with a scolloped crest.

Shady rocks. April—August. *Stem* 8 to 12 inches high, with finely divided leaves. *Flowers* bright yellow and showy. *Pods* 1-inch long.

2. C. GLAUCA, Pursh. *Pale Corydalis.*

Stem erect, branched; *leaves* glaucous, decompound; segments cuneate, trifid; *bracts* oblong, acute, shorter than the pedicals; *spur* short and rounded; *pods* erect, slender, elongated; *seeds* with a small entire crest.

Rocky woods: common. May—July. *Stem* 1 to 2 feet high. *Leaves* 1 to 3 inches long; the lower ones on long petioles. *Flowers* whitish, tinged with yellow, and flesh color.

3. ADLUMIA. Raf. CLIMBING FUMITORY.

In honor of *Mr. John Adlum*, a distinguished cultivator of the vine.

SEPALS 2, minute. PETALS 4, united in a spongy monopetalous corolla, persistent, and with 2 protuberances at the base; 4-lobed at the apex. *Pod* 2-valved, few seeded.—*A climbing biennial vine, with 2-pinnate leaves, cut-lobed delicate leaflets, and numerous panicles of drooping flowers.*

A. CIRRHOSA, Raf. *Alleghany Vine. Mountain Fringe.*

Woods and rocky hills. July—Sept. A slender climber 8 to 15 feet long. *Leaves* pinnately divided; the midrib twining like a tendril. *Flowers* in compound axillary racemes, pale violet or nearly white.

FUMARIA. Linn. FUMITORY.

Lat. *fumus*, smoke: from its disagreeable smell.

SEPALS 2, caducous. PETALS 4, unequal, one of them spurred at the base. FILAMENTS in 2 sets, each with 3 anthers. FRUIT small, indehiscent, globular, 1-seeded.—*Branched annuals, with finely dissected compound leaves, and close racemes or spikes.*

F. OFFICIANALIS, L. *Common Fumitory.*

Leaves bi-pinnate, *leaflets* lanceolate, cut into linear segments; *raceme* loose; *sepals* ovate-lanceolate, acute, shorter than the corolla.

Near cultivated grounds. May—July. *Stem* 10 to 15 inches high. *Flowers* rose-colored. Introduced from Europe.

ORDER 12. **CRUCIFERÆ.**

Herbs with a pungent watery juice, often accompanied by an etherial oil; and cruciform tetradynamous flowers: leaves alternate: fruit a silique or silicle. FLOWERS yellow or white, rarely purple or red: without bracts, generally in racemes. SEPALS 4, deciduous. PETALS 4, regular, their claws inserted into the receptacle, placed opposite each other in pairs, their spreading limbs forming a cross. STAMENS 6, of which 2 on opposite sides are shorter, solitary, and opposite the lateral sepals. OVARY, superior, 1-celled: *stigmas* 2. POD usually 2-celled, 2-valved, 1 or many-seeded, indehiscent, or opening by the valves. SEEDS attached in a single row, by a cord to each of the placentæ, generally pendulous, without albumen. EMBRYO with the 2 cotyledons variously folded on the radicle.

SECTION I. SILICULOSÆ. *Pod short and broad.*

1. THLASPI. *Linn.* PENNY CRESS.

Gr. *thlao;* to compress or flatten: on account of the flattened silicles.

CALYX equal at the base. PETALS equal. SILICLE short, flat, emarginate at the apex, many-seeded; *valves*, bract-form, winged on the back; *cells* 2, many seeded. Cotyledons accumbent.—*Annual herbs with undivided leaves and white or purplish flowers.*

1. T. ARVENSE, L. *Penny Cress.*

Leaves oblong-sagitate, coarsely toothed, smooth; *silicle* (pouch) roundish-obovate, shorter than the pedicel, its wings dilated longitudinally: *stigma* subsessile.

Cultivated stony fields. June. *Stem* a foot high, erect, and somewhat branched. *Leaves* 1 to 2 inches long, ¼ as wide. *Flowers* small, white in terminal racemes. The plant has a disagreeable flavor of garlic.

2. T. TUBEROSUM, Nutt. *Tuberous Penny Cress.*

Leaves rhomboid-ovate, obscurely dentate, smooth and sessile; radical ones petiolate; *silicle* suborbicular. April and May. Stem 4 to 6 inches high. *Flowers* rather large, rose-colored.

2. CAPSELLA. DC. SHEPHERD'S PURSE.

Diminutive of *capsa*, a chest or box: in allusion to the fruit.

CALYX equal at base. SILICLES triangular, wedge-form, obcordate, compressed laterally; *valves* carinate, not winged on the back. *Style* short. SEEDS many. *Annual. Flowers white.*

C. BURSA-PASTORIS, DC. *Shepherd's Purse.*

Radical leaves pinnatifid, hairy; *cauline ones* oblong, more or less toothed, sagitate at base.

Cultivated grounds. April—Oct. A troublesome weed. *Stem* 6 to 12 inches high. *Flowers* small, in racemes, which are finally 3 to 12 inches long. Introduced from Europe.

3. ERIOPHILA. DC.

Gr. *er, eros*, spring; and *phileo*, to love: in allusion to its early flowering.

CALYX equal. PETALS 2-parted. STAMENS without teeth. SILICLE oval or oblong; *valves* flat. SEEDS many, not margined.—*Annual. Flowers small.*

E. VULGARIS, DC. *Whitlow Grass.*

Leaves oblong-lanceolate, acute subserrate, hairy: *scape* naked: *petals* bifid: *stigma* sessile: *silicle* flat, oval, shorter than the pedicel.

Fields. March—May. *Scape* 2 to 6 inches high. *Flowers* minute, white. *Pouch* on long pedicels.

4. LEPIDIUM. Linn. PEPPER-GRASS.

Gr. *lepis*, a scale; in allusion to the form of the pouch.

CALYX equal at the base. PETALS entire, ovate. FILAMENTS without teeth. SILICLES laterally compressed, orbicular-ovate, or oval; *septum* very narrow, crossing the greater diameter; *valves* carinate, dehiscent: *cells* 1-seeded. SEEDS somewhat 3-angled. Cotyledons incumbent, rarely accumbent.—*Annual or biennial herbs, with white flowers.*

1. L. VIRGINICUM, L. *Wild Pepper-grass.*

Stem branched; *radical leaves* pinnatifid; *stem leaves* linear lanceolate, serrate, smooth; *stamens* 2 to 4; *silicles* orbicular, emarginate, shorter than the pedicel.

Dry fields and roadsides. May—Sept. *Stem* a foot high, branched above. *Flowers* small, white. *Pouch* about 2 lines long.

2. L. SATIVUM, L. *Pepper-grass. Tongue-grass.*

Leaves variously divided and cut; branches without spines: *silicles* orbicular winged. A pleasant anti-scorbutic cress: often cultivated for the table. *Stems* 1 to 3 feet high, very branching. *Silicles* 2 to 3 lines broad, very numerous. Native of the East.

5. CAMELINA. Crants. FALSE FLAX.

Gr. *kamai*, dwarf, and *linon*, flax: on account of its resemblance to flax.

CALYX equal at the base. PETALS equal. FILAMENTS without teeth. SILICLE ob-ovoid or sub-globose, obtuse, entire, mucronate with the persistent style. SEEDS numerous, oblong, not margined.—*Annual. Flowers yellow.*

C. SATIVA, DC.

Leaves lanceolate, saggitate, sessile, roughish; *silicle* inflated, margined; *cotyledons* incumbent.

Cultivated grounds: common in flax fields. May, June. *Stem* 2 to 3 feet high, panicled above. *Flowers* numerous, in corymbose panicles, small, yellow. *Pouches* large, on long slender pedicels. Introduced from Europe. It has been fancied by some to be a sort of degenerate flax.

6. COCHLEARIA. *Linn.*

Lat. *cochlear*, a spoon: in reference to its concave leaves.

CALYX equal at the base, spreading. PETALS entire. STAMENS without teeth. SILICLE oblong or ovoid-globose, with ventricose valves. SEEDS numerous, not margined.—*Flowers white. Perennial.*

C. ARMORACEA, L. *Horse-radish.*

Radical leaves on long petioles, oblong, crenate: *cauline* long-lanceolate, serrate or entire, sessile; *silicle* elliptic.

Waste grounds. Naturalized. June. *Root* large, fleshy, very pungent to the taste. *Stem* 2 to 3 feet high. *Flowers* white in elongated racemes. Native of Europe. Extensively cultivated.

CULTIVATED EXOTICS.

7. ALYSSUM. Linn.

Gr. *a*, privative; *lussa*, rage: supposed by the ancients to allay rage.

CALYX equal at the base. PETALS entire; some of the stamens with teeth. SILICLE orbicular or oval, with valves, flat or convex in the centre. *Seeds* 1 to 4 in each cell. *Perennial.*

A. SAXATILE. *Rock Alyssum. Madwort.*

Stem suffruticose at the base, subcorymbose: *leaves* lanceolate, entire, downy: *silicle* ovate-orbicular, 2-seeded; *seeds* margined. An early flowering garden annual. Native of Candia. *Stem* 1 foot high. *Flowers* numerous, yellow, in close corymbose clusters.

A. MARITIMUM, Lam. *Sweet Alyssum.*

Stem somewhat shrubby and procumbent at the base: *leaves* linear-lanceolate, acute, somewhat hoary: *pods* oval, smooth. A sweet-scented garden plant, with fine leaves and small white flowers. June—Oct. *Stem* 1 foot high.

8. LUNARIA. Linn. HONESTY.

Lat. *luna*, the moon: from the broad round *silicles*.

SEPALS somewhat bi-saccate at the base. PETALS nearly entire. STAMENS not toothed. SILICLE pedicellate, elliptical or lanceolate, with flat valves; *funiculus* adhering to the dissepiments.

1. L. BIENNIS, DC. *Honesty.*

Stem erect; *leaves* cordate, with obtuse teeth; *silicles* oval, obtuse at both ends. A biennial plant. Native of Germany. Stems 3 to 4 feet high. *Flowers* lilac-colored. Naturalized near Philadelphia. Nutt.

2. L. REDIVIVA. *Satin Flower.*

Stem erect, branching: *leaves* ovate, cordate, petiolate, mucronately serrate: silicles lanceolate, narrowed at each end. A pretty perennial from Germany. Stem 2 to 3 feet high. *Flowers* light purple.

9. IBERIS. Linn. CANDY-TUFT.

PETALS, the two outside larger than the two inner. SILICLES compressed, truncate, emarginate; the cells 1-seeded.—*Ornamental garden annuals.*

1. I. UMBELLATA. *Purple Candy-tuft.*

Herbaceous, smooth; *leaves* linear-lanceolate, acuminate; lower ones serrate; upper ones entire. *Silicles* umbellate, acutely 2-lobed. A pretty border flower. Native of South Europe. June, July. *Stem* 1 foot high. *Flowers* in simple terminal umbels. This species as well as the rest is remarkable for having the 2 outer petals larger than the 2 inner ones.

1. SAXATILIS. *Rock Candy-tuft.*

Shrubby: *leaves* linear, entire, somewhat fleshy, rather acute, smooth or ciliate. *Flowers* white, in corymbs. *Stems* nearly 1 foot high. April—June. Native of South Europe.

10. ISATIS. Linn.

SILICLE elliptical, flat, 1-celled, 1-seeded, with boat-shaped valves, which are scarcely dehiscent.

1. I. TINCTORIA, L. *Woad.*

Silicles wedge-form, acuminate at the base, somewhat spatulate at the end, very obtuse, 3 times as long as broad. Native of England; cultivated for the sake of its leaves, which yield a dye that is substituted for indigo. May—July. *Stem* 4 feet high. *Leaves* large, broad, clasping the stem. *Flowers yellow, large, in terminal racemes.*

SECTION 2. SILIQUOSÆ. *Pod mostly long and narrow.*

11. DENTARIA. Linn. TOOTH-WORT.

Lat. *dens*, a tooth; on account of the tooth-like scales of the root.

SEPALS converging. SILIQUE (pod) narrow-lanceolate, with a long tapering style: *valves* flat, nerveless, revolute, opening elastically: *placentæ* not winged. SEEDS in a single row, not margined: *funiculus* slender.—*Herbaceous plants with perennial roots, divided leaves, and white or purplish flowers.*

1. D. LACINIATA, Muhl. *Common Toothwort.*

Stem leaves 3, verticillate, on short petioles, ternate; *leaflets* 3-parted segments linear, entire, coarsely toothed or pinnatifid; *lateral ones* lobed; *root* moniliform.

Woods and rocky places near streams. April and May. *Stem* 6 to 12 inches high, simple. *Leaves* usually in a whorl about half-way up. *Flowers* in loose terminal racemes, pale, rose-colored, or white. *Petals* cuneate-obovate, attenuated below. *Pod* about 1 inch long. *Root* consisting of a chain of 3 or 4 nearly toothless-oblong tubers, of a pungent taste.

2. D. DIPHYLLA, Mich. *Pepper Root.*

Stem leaves mostly 2, on short petioles, ternate: *leaflets* ovate oblong, unequally and coarsely toothed or laciniate.

Woods and wet meadows. May. *Stem* 6 to 12 inches high. *Leaves* large, opposite or nearly so, above the middle of the stem. *Flowers* racemed, large white, the petals much larger than the calyx. *Root-stock* large, beset with teeth, with a pungent, aromatic taste. *Pod* about an inch long.

3. D. MAXIMA, Nutt. *Great Toothwort.*

Leaves 2 to 7, alternate, on long petioles, ternate; *leaflets* ovate, obtuse, coarsely toothed and incised, often 2 to 3 cleft; lateral ones lobed; axils naked; *racemes* lateral and terminal.

Woods; rare. June. *Stem* often nearly 2 feet high. *Flowers* in racemes, pale purple. *Root-stock* a string of strongly toothed tubers.

4. D. HETEROPHYLLA, Nutt. *Dwarf Toothwort.*

Radical leaves on long petioles, deeply and obtusely lobed, lobes crenately dentate, with abruptly mucronate teeth; *stem leaves* 2, rarely 3, alternate, petiolate, ternately divided; segments linear-lanceolate, entire or rarely toothed, rough-edged.

Woods. June. *Root-stock* moniliform, obscurely toothed. *Stem* 8 to 12 inches high. *Corymbs* with about 9 pale purple flowers.

12. BARBAREA. R. Brown. *Winter Cress.*

Anciently called the Herb of *Saint Barbarea.*

SEPALS erect, sub-equal at base. POD 4-angled and somewhat 2-edged; *valves* concave-carinate, awnless at the apex. SEEDS in a single row in each cell, marginless.—*Perennials or biennials with yellow flowers, and lyrately-pinnatifid leaves.*

B. VULGARIS. R. Br. *Winter Cress.*

Smooth; *lower leaves* lyrate, the terminal division round; *upper leaves* obovate: cut toothed, or pinnatifid at the base; *pod* 4-sided, tapering into a slender style.

Moist places and roadsides. Common. May—Aug. Per. *Stem* 1 to 2 feet high, smooth, branched above. *Flowers* in dense racemes, small yellow. Probably introduced.

13. NASTURTIUM. R. Brown. CRESS.

Lat. *nasus tortus,* from the effect of these acrimonious plants upon the nose.

SEPALS erect, sub-equal at base. POD 4-angled and somewhat 2-edged; *valves* concave-carinate, awnless at the apex. SEEDS in a single row in each cell, marginless.—*Perennials or biennials with yellow flowers, and lyrately-pinnatifid leaves.*

1. N. PALUSTRE, DC. *Marsh Water Cress.*

Lower leaves lyrately pinnatifid; *upper ones* pinnately lobed, amplexicaul, lobes confluent, dentate, smooth; *petals* as long as the calyx; *pods* ovoid-oblong varying to ovoid, obtuse, turgid, tipped with a very short style.

Wet places, along streams. July. *Stem* 18 inches high, mostly erect, branched. obtusely 2-angled, and striate above. *Leaves* 2 to 3 inches long, more or less pinnatifid, smooth, except a few ciliæ at the base. *Flowers* racemose, minute, yellow. *Pod* short, turgid.

2. N. HISPIDUM, DC. *Hisped Water Cress.*

Stem upright, rough-hairy; *leaves* pinnatifidly lobed, or runcinate-pinnatifid; *lobes* rather obtusely toothed; *pod* ovoid, tumid, pointed with the distinct style, scarcely more than half as long as the calyx; *petals* scarcely as long as the calyx.

Banks of streams. July, August. *Stem* angular, 2 to 4 feet high, much branched, with many paniculate racemes above. *Leaves* 3 to 6 inches long. *Flowers* minute, yellow. *Silicles* 1 line long on pedicels twice their length.

3. N. SYLVESTRE, Br. *Creeping Water Cress.*

Leaves pinnately divided; segments lanceolate, incisely serrate, the upper ones entire; *petals* longer than the calyx; *pods* oblong, slightly uneven; *style* very short.

Banks of the Delaware near Philadelphia. July. *Root* creeping. *Stem* a foot high, angular, branched. *Flowers* larger than in the preceding. Introduced from Europe.

14. ARABIS. Linn. Wall Cress.

Said to have derived its name from *Arabia*, its native country.

Sepals erect. Petals unguiculate, entire. Pod linear, plane; *valves* flat, 1-nerved in the middle. Seeds in a single row in each cell, usually margined or winged.—*Annual and biennial plants with white flowers.*

1. A. Canadensis, L. *Sickle Pod.*

Stem leaves sessile, oblong-lanceolate, acuminate; the lower, toothed; *pedicels* 3-times as long as the calyx, pubescent, reflexed in fruit; *petals* twice the length of the calyx, oblong-linear; *pods* pendulous, subfalcate, veined: *seeds* winged.

Rocky situations. May—Aug. *Stem* 2 to 3 feet high, slender, round, smooth. *Leaves* 1 to 3 inches long, ¼ as wide, sessile and clasping. *Flowers* in long terminal racemes, small, white. *Pods* long, drooping, resembling a sickle blade.

2. A. lyrata, L. *American Rock Cress.*

Stem diffusely branched, low; *stem leaves* linear or spatulate, entire, smooth and glaucous; *radical leaves* lyrately pinnatifid, often pilose: *pedicels* somewhat spreading; *petals* twice the length of the calyx; *pods* erect, spreading, with a short, straight style; *seeds* marginless.

Rocky hills. April—June. *Stem* 8 to 12 inches high, often many united at the base. *Root-leaves* numerous, resulate, 1 to 3 inches long, ¼ as wide, petiolate. *Flowers* middle size, white or rarely pale purple.

3. A. lævigata, DC. *Smooth Wall Cress.*

Erect, smooth and glaucous; *radical leaves* obovate and oblong, tapering to a petiole, sinuate-dentate; *stem-leaves* linear-lanceolate, amplexicaul, sparingly cut-toothed or entire: *petals* scarcely larger than the calyx; *pods* long and narrow, re-curved, spreading and pendulous.

Rocky places. May. *Stem* 1 to 2 feet high. round, smooth, simple, or branched above. *Root-leaves* often purplish, ¾ to 1½ inch long, half as wide, with acute teeth. *Flowers* white, few, small, in corymbed racemes. *Pod* 2 inches long, very narrow.

4. A. hirsuta, DC. *Hairy Wall Cress.*

Erect, branching; *leaves* dentate, pubescent, or scabrous; *radical ones* ovate-oblong, tapering to a petiole; *stem leaves* ovate, lanceolate, sagittate; *pedicels* as long as the calyx; *pod* straight, erect.

Low, rocky grounds. Not common. May, June. *Stem* 6 to 12 inches high; 2 or more from the same root; round, hairy at the base, dividing into slender parallel branches. *Leaves* scarcely dentate, sessile, with heart-shaped or sagittate bases. *Flowers* small, greenish white. *Pod* 1 to 2 inches long.

15. IODANTHES. Torr. & Gray. False Rocket.

Gr. *iodes*, violet colored; and *anthos*, flower.

Pod linear, elongated, terete. Seeds in a single row in each cell, margined. Style thick. Stigma capitate. Claws of the violet-purple petals longer than the calyx.—*A smooth perennial, with showy flowers in panicled racemes.*

I. HESPERIDOIDES, T. & G.

Leaves ovate oblong, toothed, pointed; the lower sometimes lyrate-pinnatifid.

Banks of rivers. Western Pa. May, June. *Stem* 1 to 3 feet high. *Petals* ½ inch long, spatulate. *Pods* 1 to 2 inches long, slightly curved upwards, longer than the spreading pedicels, knotty, rather fleshy.

16. CARDAMINE. Linn.

Kardamon, an ancient Greek name of *Cress*.

CALYX a little spreading. POD linear, flattened usually opening elastically; *valves* nerveless. SEEDS in single rows in each cell, ovate, not margined.—*Mostly perennial plants with white or purple flowers.*

1. C. HIRSUTA, L. *Hairy Cardamine.*

Mostly smooth. *Leaves* pinnate, with 5 to 13 leaflets, or lyrately pinnatifid; *leaflets* of the radical ones petioled, mostly rounded; those of the stem ovate or linear, toothed or entire; *petals* twice as long as the calyx, oblong-cuneate; *stigma* minute, subsessile.

A variable biennial, common in wet places. May—July. Stem 6 to 16 inches high. *Leaves* hairy or smooth, ½ to 1 inch long. *Flowers* small, white. *Pod* about 1 inch long, 12 to 18-seeded.

2. C. RHOMBOIDEA, DC. *Spring Cress.*

Root tuberous; *stem-leaves* ovate-rhomboid, somewhat petioled; *root-leaves* round or cordate, all somewhat angled or sparingly toothed; *pods* linear-lanceolate, pointed with a slender style, tipped with a conspicuous stigma; *seeds* round-oval.

Wet meadows and springs. Per. April—June. *Stem* 9 to 12 inches high, erect, smooth, simple. *Flowers* in terminal racemes, large, white or reddish. *Pods* ½ to 1 inch long.

3. C. ROTUNDIFOLIA, Mich. *Round-leaved Spring Cress.*

Root fibrous; *stem* weak, procumbent; *leaves* sub-orbicular, sub-dentate, smooth, petioled; *pod* spreading, slender, with a long style.

Wet grounds near springs. Per. July. *Stem* 6 to 15 inches high, decumbent. *Flowers* in terminal racemes, white or yellowish, half the size of the preceding. *Pod* ½ to ¾ inch long.

17. SISYMBRIUM. Linn. HEDGE MUSTARD.

An ancient Greek name of some plant of this family.

CALYX mostly spreading, equal at the base. PETALS unguiculate, entire. POD terete, or rather 4 to 6 sided, sessile upon the disk, the valves 1 to 3 nerved. SEEDS in a single row in each cell, oblong, marginless.—*Annual herbs with small white or yellow flowers.*

1. S. OFFICINALE, Scop. *Hedge Mustard.*

Leaves runcinate and with the stem hairy. *Flowers* in a long raceme; *pod* subulate, closely pressed to the stem.

Waste places. Introduced. May—Sept. An unsightly branched weed, 1 to 3 feet high. *Flowers* yellow, very small, terminating the raceme which becomes 1 to 2 feet long, environed by the appressed sessile pods.

2. S. THALIANUM, Hook. *Mouse-ear Hedge Mustard.*

Radical leaves obovate or oblong, entire or barely toothed; *stem leaves* lanceolate, sessile; *pods* ascending, rather longer than the pedicels.

Rocks and sandy fields. April and May. *Stem* 6 to 15 inches high, slender, terete, with slender erect branches. *Leaves* mostly in a radical cluster, 1 to 2 inches long; those of the stem ½ to 1 inch long, denticulate, ciliate. *Flowers* small, white. Probably introduced.

3. S. CANESCENS, Nutt. *Hoary Hedge Mustard.*

Leaves 2-pinnatifid, the divisions small and toothed; *petals* scarcely exceeding the calyx; *pods* in long racemes, oblong or rather clavate, not longer than the spreading pedicels.

Banks of streams. Rather rare. May. *Stem* slender, 1 to 2 feet high. *Flowers* very small, pale yellow. *Pedicels* spreading with the pod, often erect. A very variable species, often hoary pubescent.

18. ERYSIMUM. Linn. TREACLE MUSTARD.

Gr. *eruo*, to draw blisters.

CALYX erect, closed. PODS columnar, 4-sided; *stigma* capitate. SEEDS in a single row in each cell, oblong, marginless; *cotyledons* often obliquely incumbent.—*Chiefly biennials with yellow flowers.*

1. E. CHERIANTHOIDES, L. *Wormseed Mustard.*

Leaves lanceolate, somewhat toothed, minutely roughish; *pods* erect, spreading, twice as long as the pedicels; *stigma* small, nearly sessile.

Along streams: rare. Introduced. July—Sept. *Stem* 1 to 2 feet high, erect, branched, roughish. *Flowers* yellow, in long terminal racemes. *Pod* about 1 inch long, pointed with a short style.

2. E. ARKANSANUM, Nutt. *Western Wall-flower.*

Minutely roughish hairy; *stem* simple; *leaves* lanceolate, somewhat toothed; lower ones runciuate-toothed; *flowers* racemose corymbed at summit.

A fine plant with showy flowers resembling the Wall-flower. Native of the Western States, cultivated in gardens. June and July. Biennial. *Stem* 1 to 3 feet high, slender. *Leaves* 2 to 3 inches long, ¼ to ½ inch wide. *Sepals* straw-color. *Petals* large bright orange-yellow. *Siliques* 3 inches long, 4-angled, sub-erect.

19. SINAPIS. Linn. MUSTARD.

Gr. *sinapi*, which is said to come from the Celtic *nap*, a turnip.

SEPALS equal at the base, spreading. PETALS ovate, with straight claws. PODS nearly terete, with a short beak; *valves* bearing nerves. SEEDS globose, 1-rowed.—*Annual or biennial European plants, with yellow flowers, and lyrate, pinnatifid, or incised leaves.*

1. S. NIGRA, L. *Black Mustard.*

Lower leaves lyrate or lobed; *upper* linear-lanceolate, entire, smooth; *pods* smooth and even, somewhat 4-sided, appressed to the stem, tipped with a slender style.

Fields and waste places: partly naturalized. June and July. *Stem* 2 to 6 feet high. *Flowers* yellow. *Pods* very numerous, nearly 1 inch long. *Seeds* numerous, nearly black, used as a condiment.

2. S. ALBA, L. *White Mustard.*

Leaves pinnatifid, or lyrate, the terminal lobes large, nearly smooth; *pods* mostly hispid, spreading, scarcely as long as the sword-form beak.

Cultivated; sometimes spontaneous in old fields. June and July. *Stem* 2 to 3 feet high. *Flowers* corymbose, yellow, rather large. *Seeds* large, pale yellow. Used as a condiment, and much esteemed in medicine.

20. RAPHANUS. Linn. RADISH.

Gr. *ra*, quickly; and *phaino*, to appear; from its rapid growth.

CALYX erect. PETALS obovate, unguiculate. PODS transversely many-celled or dividing into several joints, the lower often seedless and stalk-like; the upper necklace-form, with no proper partition.—*Annuals or Biennials.*

1. R. RAPHANISTRUM, L. *Wild Radish. Charlock.*

Leaves simply lyrate; *pod* terete, jointed, smooth, becoming in matury 1-celled, longer than the style; *seeds* 3 to 8.

Fields and waste places. Introduced. July. *Stem* 1 to 2 feet high, hispid. *Flowers* yellow, about as large as the common *radish.*

2. R. SATIVA, L. *Garden Radish.*

Lower leaves lyrate, petiolate; *pod* torose, terete, acuminate, scarcely longer than the pedicels. A well known cultivated salad root from China. *Stem* 2 to 4 feet high, very branching. *Flowers* white, tinged with purple.

21. CHEIRANTHUS. R. Brown. *Wall-Flower.*

Arabic *kheyry*; and *anthos*, a flower.

CALYX closed, 2 of the sepals gibbous at the base. PETALS dilated. POD terete or compressed. STIGMA 2-lobed or capitate. SEEDS in a single series, ovate compressed.—*Showy perennials, with lanceolate or ovate slightly toothed leaves, and handsome fragrant flowers in panicled clusters or racemes.*

1. C. HESPERIDOIDES, T. & G. *Rocket Wall-Flower.*

Smooth; *lower leaves* lyrate-pinnatifid; *upper* ovate-lanceolate, unequally and sharply serrate; *pedicels* as long as the calyx; limb of the petals obovate, entire.

Banks of streams. Western Pa. May—July. *Stem* 1 to 3 feet high, simple or branched. *Leaves* thin, 3 to 5 inches long, 1/4 as wide, those of the stem scarcely petiolate. *Flowers* in terminal axillary racemes, pale purple, small. *Pods* 1 1/2 inches long. Per.

2. C. CHEIRI. *Wall Flower.*

Stem somewhat shrubby at the base; *leaves* entire or slightly dentate, lanceolate, acute, smooth; *branches* angular; *petals* obovate; *pods* erect, acuminate. A popular garden flower from South Europe, admired for its agreeable odor, and its handsome corymbose clusters of orange or yellow flowers. Per.

CULTIVATED EXOTICS.

22. HESPERIS. Linn. Rocket.

Gr. *hesperis*, evening; when the flower is most fragrant.

Calyx closed, furrowed at the base, shorter than the claws of the petals. Petals bent obliquely, linear or obovate. Pod 4-sided, 2-edged or sub-terete. Seeds not margined. Stigmas forked, with the points converging.—*Perennials.*

1. H. matronalis. *Rocket. Sky Rocket.*

Stem simple, erect; *leaves* lanceolate, ovate, denticulate; *petals* emarginate mucronate; *pedicels* as long as the calyx. A fine garden perennial. *Stem* 3 to 4 feet high. *Flowers* purple, sometimes double and white. Said to be found native about Lake Huron.

2. H. aprica. *Siberian Rocket.*

Stem a foot high, erect, simple, pubescent; *leaves* oblong obtuse, entire, cilliate-hispid; *pedicels* as long as the calyx. *Flowers* purple. May and June. From Siberia.

23. MATTHIOLA. R. Brown.

In honor of *P. A. Matthiola*, physician to Ferdinand of Austria.

Calyx closed, 2 of the sepals gibbous at the base. Petals dilated. Pods terete. Stigmas connivent, thickened or connate at the back.—*Herbaceous or shrubby oriental plants, clothed with a hoary stellate pubescence.*

1. M. annuus. *Ten Week Stock.*

Stem herbaceous, erect, branched, 2 feet high; *leaves* hoary canescent, lanceolate, obtuse, subdentate; *pod* sub-cylindrical, without glands. A fine garden flower from South Europe. *Flowers* variegated.

2. M. incanus. *Purple July Flower.*

Stem shrubby at the base, erect, branched, 1 to 2 feet high. *Leaves* lanceolate, entire, hoary-canescent. *Pods* sub-cylindrical, truncate and compressed at the apex, without glands. *Flowers* purple and crimson. A popular garden flower, native of England.

24. BRASSICA. Linn.

Celtic *bresic;* the cabbage.

Sepals equal at the base, (mostly) erect. Petals obovate. Filaments without teeth. Pod sub-compressed; *valves* concave, with a central vein. Style short, subterate, obtuse. Seeds globose in a single (sometimes double) row.—*Flowers yellow.*

1. B. CAMPESTRIS. *Cale.*

Leaves somewhat fleshy and glaucous; the upper one cordate-amplexicaul, acuminate. *Stem* 1½ to 3 feet high, round, smooth above, with a few scattered reversed hairs below. *Racemes* 1 to 2 feet long. *Corolla* yellow, nearly ½ inch in diameter.

b. Rutabaga. Swedish Turnip.

Root tumid, napiform, sub-globose, yellowish; growing to an enormous size. Cultivated for cattle. Native of Sweden.

ORDER 13. CAPPARIDACEÆ.

Herbaceous plants or shrubs, without a true stipule, but sometimes with spines in their place. Leaves alternate, petioled, undivided or palmate. FLOWERS cruciform, solitary or racemose. SEPALS 4. PETALS 4, or even 8, imbricated or none, cruciate, usually unguiculate and unequal. STAMENS 6 to 12, or some multiple of 4. DISK hemispherical or elongated. OVARY stipitate, of 2 united carpels. STYLES united into one. STIGMA discoid. FRUIT either pod-shaped and dehiscent, or fleshy and indehiscent. SEEDS many, kidney-shaped, without albumen.

1. GYNANDROPSIS. DC.

Gr. *Gynandria*, a Linnean class; *opsis*, appearance.

CALYX of 4 sepals, spreading. PETALS 4, unequal. STAMENS 6; *filaments* adnate below to the linear, elongated torus, its whole length. POD linear-oblong, raised on a long stipe which rises from the top of the torus.—*Leaves digitate. Flowers racemed.*

G. PENTAPHYLLA, DC. *Five-leaved Gynandropsis.*

Middle leaves petiolate, 5-foliate; *floral* and lower ones 3-foliate; *leaflets* obovate, entire or denticulate.

Cultivated grounds. July. Annual. *Stem* 2 feet high, viscid, simple. *Flowers* of a very irregular structure, white in long terminal racemes. *Petals* obovate with very long capillary claws. *Pod* 2 inches long, linear, on a long foot-stalk.

2. POLANISIA. Raf.

Gr. *polus*, many or much, and *anisos*, unequal.

SEPALS 4, distinct, spreading. PETALS 4, unequal, with claws. STAMENS 8 to 32, unequal. RECEPTACLE not elongated. POD stalkless or nearly so, above the stamens, linear or oblong, veiny, turgid, many-seeded.—*Strong scented annuals with glandular or clammy hairs, and digitate leaves.*

P. GRAVEOLENS, Raf. *Strong scented Polanisia.*

Viscid, pubescent: *leaves* ternate; *leaflets* elliptic-oblong; *flowers* axillary, solitary; *stamens* 8 to 12; *capsule* oblong lanceolate, alternate at the base.

Gravelly banks of streams. June—Aug. *Stem* 1 foot high, branching, striate. *Flowers* in a corymbose raceme, yellowish-white and purple. Whole plant more or less viscid and fetid.

3. CLEOME. Linn.

SEPALS sometimes united at the base. PETALS 4, minute or roundish. STAMENS 4 to 6. POD subsessile or stipitate.—*Herbs or shrubs with simple on digitate leaves, and racemed or solitary flowers.*

C. PUNGENS. *Spiderwort.*

Glandular pubescent. *Stem* simple, and with the petioles covered with prickles; *leaves* 5 to 9 foliate, on long petioles; *leaflets* elliptic, lanceolate acute at each end, obscurely denticulate; *bracts* simple; *flowers* racemed; *sepals* distinct; *petals* on filiform claws; *stamens* 6, twice as long as the petals. A common garden plant with curious purple flowers. July and August.

ORDER 14. **RESEDACEÆ.**—*Mignionettes.*

Herbs with unsymmetrical spiked, racemose, small flowers, and alternate leaves. CALYX not closed in the bud; SEPALS somewhat united at the base, unequal, green. PETALS lacerated, unequal. STAMENS 8 to 20 on the disk. TORUS hypogynous. POD 3 to 6 lobed, 3 to 6 horned, 1-celled with 3 to 6 pointed placentæ, opening at the top long before the seeds are full grown.

RESEDA. Linn.

Lat. *resedo*, to calm; the plants are said to relieve pain.

SEPALS many. PETALS 4 to 7, often cleft, unequal. STAMENS 10 to 40, turned to one side.—*Annual herbs with very small flowers.*

1. R. LUTEOLA. *Dyer's Weed.*

Leaves lanceolate, entire with a tooth on each side at the base; *calyx* 4-cleft; *petals* 4; the upper one 3 to 5 cleft; the two lateral 3-cleft; the lower one linear and entire; *pods* depressed. Scarcely naturalized; flowering through the season. *Stem* 2 feet high. *Flowers* greenish yellow, arranged in a long spike. Used for dying yellow.

2. R. ODORATA. *Mignionette.*

Leaves entire, 3-lobed; *sepals* shorter than the petals. A well known and universal favorite of the garden; native of Egypt. *Stem* procumbent. *Flowers* very fragrant.

ORDER 15. **VIOLACEÆ.**

Herbs with simple leaves usually alternate, sometimes opposite, stipulate, and axillary nodding flowers with a somewhat irregular, 1-spurred corolla of 5-petals, 5 hypogynous stamens pointed by their anthers, and a 1-celled 3-valved pod with 3 parietal placentæ. SEPALS 5, persistent, slightly united, elongated at the base, the two lateral interior. PETALS twisted, imbricate in the bud. STAMENS with short and broad filaments, prolonged beyond the anther cells, and more or less coherent over the stigma; two of the stamens with spurs or appendages which are received into the spur of the corolla. STYLE club-shaped; STIGMA 1-sided, cucculate. FRUIT a 3-valved capsule. SEEDS numerous; ALBUMEN fleshy.

1. VIOLA. Linn. VIOLETS.

The ancient *Latin* name of the genus.

SEPALS 5, auriculed at their base. PETALS 5, unequal, the larger one spurred at the base; the 2 lateral equal, opposite. STAMENS 5, approximate; *filaments* distinct; *anthers* connate, the lobes diverging at the base. CAPSULE 1-celled, 3-valved; *seeds* attached to the valves.—*Low herbaceous perennial plants, acaulescent or caulescent. Peduncles angular, solitary, 1-flowered recurved at the summit in an inverted position.* (Often producing concealed apetalous flowers during the whole summer.)

* *Stemless: leaves and scapes from subterranean root-stocks: perennials.*

1. Flowers blue: leaves undivided.

1. V. CUCCULLATA, Ait. *Hood-leaved Violet.*

Smoothish; *leaves* cordate, cucullate at the base, toothed, veined; *stipules* small, linear, fringed: *lateral petals* bearded: *spur* short, obtuse.

Low grounds, meadows, &c.: common. April—June. *Leaves* on long petioles, strongly heart-shaped or triangularly kidney-shaped, rolled at the base, into a hooded form. *Flowers* light blue or purple, with somewhat 4-sided scapes. *Petals* twisted. Whole plant variable.

2. V. SAGITTATA, Ait. *Arrow-leaved Violet.*

Smoothish or hairy; *leaves* oblong-lanceolate, sagittate-cordate, sub-acute, often hastate at the base, serrate or crenate-dentate: *petals* oblong, ovate, all except the lower one, bearded; *spur* short, very thick and sac-like.

Gravelly fields: common. April and May. *Leaves* varying from oblong-sagittate to triangular-hastate on margined petioles, acute or not. *Flowers* middle sized, purple, on scapes 3 to 5 inches long. Var. *emarginata* Nutt. *Leaves* almost triangular, lacerately toothed at the base; *petals* emarginate or bidentate.

3. V. OVATA, Nutt. *Ovate-leaved Violet.*

Leaves ovate, crenate, ciliate, abruptly decurrent on the short petiole, mostly roughish, pubescent; *lateral petals* bearded; *stigma* a little beaked.

Dry hills. April and May. *Leaves* numerous, mostly hairy on both sides, sometimes nearly smooth, ¾ as wide as long, acute or not, upper ones laciniate-dentate. *Sepals* ciliate, oblong-ovate, deeply emarginate behind. *Petals* entire, veiny, obovate, the lateral ones with dense white beards. *Spur* broad.

4. V. SORORIA, Willd. *Bearded or Kindred Violet.*

Leaves orbicular, or roundish-cordate with the sinus often closed, crenate-serrate, mostly pilose, thickish, purple beneath, flat lying on the ground; *lateral petals* densely bearded, lower one somewhat bearded, upper one naked; *stigma* depressed, with a deflexed beak.

Dry hills, open woodlands. April and May. *Leaves* 1 to 2 inches long, mostly orbicular or sub-reniform. *Scapes* few, about as long as the leaves, smooth, with small subulate opposite bracts below the middle. *Sepals* lance-oblong, rather obtuse. *Corolla* reddish blue; *petals* obovate, entire. *Capsule* smooth. (Darlington's F. C.)

5. V. ELLIPTICA. *Elliptic-leaved Violet.*

Leaves elliptical-oblong, crenately toothed or entire, somewhat pilose; *flowers* on slender scapes.

Gravelly hillsides; rare. May and June. *Leaves* ½ to 1½ inches long, ½ as wide, on slender petioles 2 to 4 inches long. *Scapes* few, slender, 4 to 6 inches long with 2 small opposite subulate bracts above the middle. *Flowers* smaller than in the preceding species, pale blue. Lateral and lower *petals* densely bearded, and profusely marked with white lines.

2. Leaves divided.

6. V. PEDATA, L. *Bird's-foot Violet.*

Leaves pedate, nearly smooth, from 5 to 7 parted; *segments* linear-lanceolate, obtuse or acute, 1 or 2-toothed, or somewhat 3-lobed at the apex, tapering downwards; *stipules* radical, pectinately lacerated; *petals* beardless; *spur* very short; *stigma* large, obliquely truncate; *beak* obscure.

Dry hills or sandy woods. May and June. *Root* premorse. *Scapes* 2 to 5 inches high, several from the same root. *Flowers* large, pale blue, sometimes almost white; *petals* rounded at the extremities. This handsome species presents several varieties—one with variegated flowers, the 2 upper petals intensely velvety purple, and fully as handsome as the finest *Pansy*.

7. V. PALMATA, L. *Palmate Violet.*

Pubescent; *leaves* reniform-cordate, palmate or hastate-lobed, variable; the intermediate one always larger; *stipules* lanceolate, subciliate; lateral *petals* densely bearded; *spur* short; *stigma* capitate, recurved.

Moist woodlands and low grounds; common. May. *Scapes* several, 4 to 6 inches high, often pilose with 2 small lanceolate bracts below the middle. *Rootstock* scaly. The early leaves are ovate, entire; the later and perfect are often purple beneath, variously lobed and cleft. *Petals* purple or bright blue, entire, veiny, white at the base; upper ones smaller; lateral ones densely bearded and marked with blue striæ.

3. Leaves undivided. Flowers white, the lower petals veined with purple.

8. V. LANCEOLATA, L. *Lance-leaved Violet.*

Leaves very smooth, narrow, lanceolate, attenuated at each end, sub-serrate; *sepals* lanceolate, acute, smooth; *petals* beardless, nearly equal.

Swamps and wet meadows. April and May. *Rhizoma* creeping. *Leaves* narrow, and with the stalk 3 to 5 inches long. *Petioles* half round. *Flowers* small, white, inodorous. Upper and lateral petals marked with violet lines.

9. V. PRIMULÆFOLIA, L. *Primrose-leaved Violet.*

Leaves oblong-ovate, mostly acute, sub-cordate and somewhat unequal at the base, decurrent on the petiole, crenate-serrate, smooth above; *sepals* lanceolate; *petals* obtuse, lateral ones sometimes sparingly bearded and striate; *stigma* capitate and rostrate.

Wet grounds; rare. May. Intermediate between V. *lanceolata* and V. *blanda*. *Leaves* 2 to 5 inches long, and an inch or more wide, about as long as the scape. *Flowers* white, odorous, on sub-4-sided stalks.

10. V. BLANDA, Willd. *White Sweet Violet.*

Leaves broad-cordate, remotely serrate or crenate, minutely pubescent, sinus rounded; *petals* ovate, obtuse, nearly beardless; *stigma* depressed, acutely margined.

Wet meadows; common. April and May. *Leaves* close to the earth, nearly round, ½ to 1½ inches in diameter, flat and thin. *Flowers* small, white streaked with purple, very fragrant.

4. Flowers yellow.

11. V. ROTUNDIFOLIA, Mich. *Round-leaved Violet.*

Leaves round-ovate, heart-shaped, slightly crenate, appressed to the ground; *lateral petals* bearded and marked with brown lines, lower ones smaller; *spur* very short.

Rocky woods. May. *Scape* 1 to 3 inches high. *Leaves* 1 inch broad at flowering, increasing to 3 or 4 inches in summer. *Flowers* pale yellow, middle sized.

** *Perennials with stems.*

5. Leaves undivided: flowers yellow or yellowish white.

12. V. PUBESCENS, Ait. *Downy Yellow Violet.*

Softly pubescent; *stem* elongated, erect; *leaves* very broadly heart-shaped, dentate, more or less acuminate; *stipules* large, ovate, somewhat toothed; *spur* extremely short; *lower petals* veined with purple. Var. 1., *eriocarpa*, is large, villous pubescent; *capsule* densely villous. Var. 2., *scabriuscula*, is smaller, slightly pubescent, and brighter green; *stems* decumbent; *pods* smooth or woolly.

Rich woods; common. May. *Stem* 6 to 12 inches high, generally solitary, somewhat angular. *Peduncles* rather shorter than the leaves, axillary, solitary, with 2 subulate bracts. *Flowers* middle sized, yellow; lateral petals slightly bearded, and with the lower ones striped with dark purple.

13. V. HASTATA, Mich. *Halbert-leaved Yellow Violet.*

Nearly smooth; *stem* erect, simple, leafy above; *leaves* on long petioles, cordate-lanceolate or hastate, acuminate; *lobes* obtuse, dentate; *stipules* minute, ovate; *spur* very short; *lower petal* dilated, sub-3-lobed; lateral ones slightly bearded.

Mountains and pine woods. May. *Stem* 6 to 10 inches high. *Peduncles* shorter than the leaves. *Flowers* yellow.

14. V. STRIATA, Ait. *Striped Violet.*

Stem assurgent, angular, smooth; *leaves* alternate, heart-shaped, finely serrate, often acuminate; *stipules* large, oblong-lanceolate, strongly fringe-toothed; *spur* thickish, much shorter than the petals; *stigma* recurved, sub-pubescent.

Wet grounds. May. *Stem* 6 to 12 inches high, half round. *Leaves* 1 to 1½ inches wide, on petioles 1 to 2 inches long. *Peduncles* axillary. *Flowers* large, yellowish-white; *lateral petals* densely bearded; lower one striped with dark purple.

6. Flowers pale blue, or purplish.

15. V. ROSTRATA, Muhl. *Long Spurred Violet.*

Stem diffuse, erect; *leaves* smooth, roundish-heart-shaped, serrate; the upper acute; *stipules* large, lanceolate, serrate-cilliate; *petals* obovate, beardless; *spur* longer than the corolla.

Shaded hillsides. June. *Stem* 4 to 8 inches high, smooth. *Flowers* large, pale blue, with a very long spur similar to that of the larkspur, by which this species is readily recognized.

16. V. MUHLENBERGII, Torr. *Spreading Violet.*

Stems ascending, at length with creeping branches, smooth; *leaves* round, heart-shaped, or the lowest kidney-shaped, crenate; the uppermost slightly acuminate; *stipules* large, lanceolate, fringe-toothed; *spur* tapering, about half the length of the petals; *petals* obovate, obtuse, the lateral ones bearded; *stigma* rostrate.

Shaded wet places. May and June. *Stem* 6 to 8 inches high. *Flowers* middle-sized, pale purplish.

17. V. CANADENSIS, L. *Canadian Violet.*

Upright; *leaves* heart-shaped, pointed, serrate, lower ones on long petioles; *stipules* ovate-lanceolate, entire; *sepals* subulate-lanceolate; *spur* very short; *stigma* short, pubescent.

Shady woods. May—Aug. *Stem* 9 to 18 inches high, usually simple. *Flowers* large, blue without, paler within; upper petals marked with blue lines; lateral ones bearded. Flowering all summer.

18. V. TRICOLOR, L. *Pansy-Heartsease.*

Stem angular, diffuse; *leaves* oblong-ovate; *lower ones* oblong cordate, deeply crenate; *stipules* runcinately pinnatifid or lyrate, the terminal segments as large as the leaves; *spur* short and thick.

Gardens, where its pretty flowers are earliest in spring and latest in autumn. *Flowers* variable in size; the 2 upper petals purple; the 2 lateral white; and with the lower striate at base; all yellow at base.

V. ODORATA. *Sweet Violet.*

Native of Europe. *Flowers* dark purple, very fragrant; double by cultivation.

2. SOLEA. Gingens, DC. GREEN VIOLET.

In honor of *Wm. Sole*, author of an Essay on *Mentha.*

SEPALS scarcely equal, carinate, not auricled at the base, decurrent into a pedicel, at length reflexed. PETALS unequal, the lowest one 2-lobed and somewhat gibbous at the base. STAMENS cohering, the lower 2 bearing a gland above the middle. CAPSULE somewhat 3-sided. SEEDS 6 to 8, very large.—*A homely perennial with greenish-white flowers in the axils of the leaves on short pedicels.*

1. S. CONCOLER, DC. *Green Violet.*

Stem simple, erect; *leaves* crenate-lanceolate, sessile, irregularly toothed above; *peduncles* short, 2 to 3 flowered; *flowers* small, greenish; *calyx* nearly as long as the petals: *spur* none.

Shady woods; rare. April and May. Delaware and Franklin counties, and western parts of the State. *Stem* 2 to 4 feet high.

ORDER 16. **CISTACEÆ.**

Herbs or low shrubs, with regular flowers, distinct hypogynous stamens, and a 1-celled 3 to 5 valved pod. LEAVES entire, opposite or alternate, usually feather-veined. FLOWERS white, yellow, or red; very fugaceous, in 1-sided racemes. SEPALS 5, persistent, unequal; the 2 external small-like bracts, sometimes wanting. PETALS 3 to 5, usually fugacious, convolute in the opposite direction from the calyx. STAMENS indefinite, hypogynous, distinct; ANTHER innate. STYLE single or none, in the bud. OVULES few or many, on slender stalks, with the orifice at the apex. FRUIT capsular 1-celled, 3 to 5 valved, with as many parietal placentæ borne on the middle of the valves.

1. HELIANTHEMUM. Tourn. ROCK-ROSE.

Gr. *helios*, the sun; *anthos*, a flower.

SEPALS 5, the 2 outer smaller, twisted in æstivation. PETALS 5, or rarely 3, sometimes abortive, crumpled in the bud, fugacious. STAMENS many. STYLE short or none; *stigma* 3-lobed, scarcely distinct. CAPSULE strictly 1-celled, triangular, 3-valved, opening at the top; *seeds* angular. FLOWERS frequently of 2 sorts; the *primary* or earliest ones, with large petals, numerous stamens, and many-seeded pods; *secondary* or later ones much smaller, and few-seeded pods.—*Herbs with perennial roots, and yellow flowers, which open in sunshine, and cast their petals by the next day.*

1. H. CANADENSE, Michx. *Rock Rose. Frost Weed.*

Stem at first simple, erect, or ascending; *leaves* oblong or somewhat lanceolate, acute, hairy, alternate, without stipules.

Sandy or gravelly dry soil. June—Aug. *Stem* about 1 foot high. *Leaves* ¾ to 1 inch long, ¼ as wide, entire, sub-sessile. Primary or terminal flowers large, few or solitary, on peduncles as long as the flowers; *petals* large bright yellow; secondary flowers axillary, very small, nearly sessile, solitary or somewhat clustered, on short leafy branches; the petals very small or none; the outer sepals usually wanting. Late in autumn, chrystals of ice shoot from the cracked bark; hence the common name.

2. LECHEA. Linn. PINWEED.

In honor of *John Leche*, a Swedish botanist.

CALYX 3-sepalled, with 2 outer bracts or sepals, persistent. PETALS 3, inconspicuous, lanceolate. STAMENS 3 to 12. STYLE scarcely any. STIGMAS 3, scarcely distinct. CAPSULE 3-celled, 3-valved; *placentæ* nearly as the valves, roundish, each 1 to 2-seeded.—*Inconspicuous perennial branching plants, with very small greenish or purplish flowers.*

1. L. MAJOR, Michx. *Large Pinweed.*

Hairy; *stem* erect, simple, producing slender prostrate branches from the base; *leaves* oblong-lanceolate, mucronate, pilose, alternate and opposite, or sometimes whorled; *panicle* short, leafy: *flowers* densely crowded in panicled clusters; *pedicels* shorter than the globose depressed (very small) pods.

Dry woods and fields. July. *Stem* 1 to 2 feet high, erect. *Flowers* small, brown, in racemose clusters.

2. L. MINOR, Lam. *Smaller Pinweed.*

Stem slender, upright or diffusely branched, nearly smooth; *leaves* linear-lanceolate, acute; *leafy shoots* densely tufted at the base; *panicle* leafy, its branches elongated; *flowers* loosely racemed; *pedicels* mostly longer than the globose pods.

Dry hills. July—Sept. *Stem* 8 to 12 inches high, often decumbent at the base. *Stem-leaves* ½ by ¼ inch alternate, sparingly ciliate and revolute at the margin; those of the long slender branches minute. *Flowers* larger than in *L. major*. *Petals* brownish-purple, cohering at the apex. *Capsules* also larger than in the preceding.

3. HUDSONIA. Linn.

In honor of *Wm. Hudson*, author of "*Flora Anglica.*"

CALYX 5-parted, segments unequal, the two outer ones minute. PETALS 5. STAMENS 9 to 30. STYLE straight, filiform. STIGMA simple. CAPSULE oblong enclosed in the calyx, 1-celled, 3-valved, 1 to 6-seeded.—*Bushy heath-like little shrubs with very numerous branches, and minute awl-shaped or scale-like persistent leaves, and numerous, small, showy, bright-yellow flowers.*

1. H. ERIOCOIDES, L. *Heath-like Hudsonia.*

Downy but greenish; *stem* sub-erect; *branches* elongated; *leaves* filiform, awl-shaped, loose; *flowers* on slender naked stalks; *sepals* acutish.

Dry sandy woods; rare, May and June. *Stem* 4 to 6 inches high, much branched. *Leaves* small persistent. *Flowers* small, yellow, with about 15 stamens.

2. H. TOMENTOSA, Nutt. *Downy Hudsonia.*

Hoary and downy; *leaves* oval or oblong, close pressed and imbricated; *flowers* aggregated, sessile; *calyx* sub-cylindrical, with obtuse segments.

Sandy soil; rare. June. *Stem* ascending, much branched. *Flowers* yellow, smaller than the preceding. *Stamens* 9 to 18. Whole plant silvery-gray and tomentose.

ORDER 17. DROSERACEÆ.

Bog herbs mostly stemless, often covered with glandular hairs; alternate leaves, or clustered at the base of a scape, tapering into a petiole, rolled up from the apex to the base in vernation. SEPALS 5, persistent, equal. COROLLA of 5 nearly equal petals. STAMENS 5 to 15; ANTHERS turned outwards. STYLES 3 to 5, either wholly distinct, or slightly connected at the base, bifid or branched. FRUIT a capsule 1 to 3 celled, 3 to 5 valved, usually many-seeded, sometimes ariled.

1. DROSERA. Linn. SUNDEW.

Gr. *drosos*, dew; the glands exuding a dew-like secretion.

CALYX deeply 5-cleft. PETALS 5. STAMENS 5. STYLES 3 to 5, each 2-parted. CAPSULE superior, globose or ovoid, 1 to 3 celled, 3 to 5 valved, the valves bearing the numerous seeds on the middle, for their whole length.—*Low perennial aquatic herbs, with the leaves clothed with reddish gland-bearing bristles.*

1. D. ROTUNDIFOLIA, L. *Round-leaved Sundew.*

Leaves all radical, orbicular, abruptly narrowed into the spreading hairy petioles, fringed with purple cilia, pilose above; *scape* erect, bearing a terminal and mostly simple 1-sided raceme, nodding at the apex, so that the fresh blown flower is always the highest.

Sphagnous Swamps. July and August. A singular plant at once distinguished by the reddish glandular hairs with which the leaves are beset. *Scape* 4 to 8 inches high. *Flowers* small whitish.

2. D. LONGIFOLIA, L. *Long-leaved Sundew.*

Leaves spatulate-oblong, erect, spreading, tapering into the long rather erect naked petioles; *scape* declined at the base; *seeds* oblong, not arillate.

Swamps; rare. July and August. *Scape* 3 to 6 inches long, usually curved to one side at the base. *Flowers* yellowish white 5 to 9 in a raceme, twice as large as in the preceding.

3. D. FILIFORMIS, Raf. *Thread-leaved Sundew.*

Leaves very long and filiform, nearly erect, with no distinction between the blade and the stalk, glandular the whole length; *scape* longer than the leaves, many-flowered, simple or bifid.

Sandy Swamps. Aug. and Sept. *Scape* 8 to 12 inches high. *Leaves* 6 to 10 inches long. *Flowers* purple, few, in a 1-sided raceme.

SUB-ORDER. PARNASSIEÆ.

Smooth herbs with slightly perigynous stamens, an outer series of them sterile and in clusters, imbricated petals and 4 sessile stigmas opposite the parietal placentæ. Leaves alternate, not coiled in the bud.—*Consists of the following genus of doubtful affinity.*

2. PARNASSIA. Linn.

From *Mount Parnassus*; on account of the beauty of this plant.

CALYX deeply 5 cleft. PETALS 5, veiny, spreading, rather persistent, with a cluster of somewhat united sterile filaments at the base of each. STAMENS 5, alternate with the petals. STIGMAS 4, sessile. CAPSULE 4-valved, 1-celled. SEEDS very numerous, arillate.—*Perennial herbs with chiefly entire radical leaves; and solitary flowers terminating the long naked scapes.*

P. CAROLINIANA, Michx. *Grass of Parnassus.*

Radical leaves cordate, orbicular-ovate on long petioles; *stem leaf* sessile, clasping; *sterile filaments* in 5 clusters, 3 in each, distinct to near the base, surmounted with little yellow spherical tips; *petals* more than twice as long as the calyx, marked with many greenish transparent veins.

Wet banks: Limestone, Montour Co. Not common. Aug. and Sept. *Scape* 12 to 18 inches high. *Leaves* about 7-veined, usually but one on the stalk low down and clasping. *Flowers* solitary, large, yellowish-white. An elegant and interesting plant.

ORDER 18. **HYPERICACEÆ.**

Herbs or shrubs with opposite entire dotted leaves and no stipules, regular hypogynous flowers, with many or few stamens collected in three or more clusters, or bundles. FLOWERS perfect, mostly yellow, with cymose inflorescence. SEPALS 4 to 5 persistent, imbricated in the bud. PETALS 4 to 5 mostly deciduous with a twisted æstivation and oblique veins. STAMENS usually numerous and cohering at base in three or more parcels. CAPSULE 2 to 5 (rarely 6 to 7,) lobed, with as many persistent styles which are at first sometimes united, 1-celled with 2 to 5 parietal placnetæ. SEEDS very numerous, small, without albumen; EMBRYO straight.

1. HYPERICUM. Linn. *St. John's Wort.*

SEPALS 5, more or less united at the base, mostly equal, leaf-like. PETALS 5, oblique and often without equal sides. STAMENS numerous or few united or clustered in 3 to 5 parcels without interposed glands. STYLES 3 to 5, distinct, or united at base, persistent. CAPSULE membranaceous, 1 or 3 to 5-celled.—*Herbs or shrubs with opposite entire leaves, punctate with pellucid dots, and yellow flowers; solitary, or in cymose panicles.*

* *Stamens* 20 to 100. *Styles* 3 to 5. *Flowers mostly terminal, large, yellow: herbaceous perennials.*

1. H. PYRAMIDATUM, Ait. *Giant St. John's Wort.*

Stem square, branching above; *leaves* oblong-lanceolate, sessile, somewhat clasping, acute, smooth, pellucid-punctate; *sepals* ovate-lanceolate; *styles* free, as long as the stamens; *seeds* numerous.

River banks and hills. July, Aug. A large flowering perennial species, 3 to 5 feet high, scarcely angular, smooth, rigid and herbaceous. *Flowers* 1½ inches in diameter, showy, few or solitary at the ends of the branches. *Stamens* capillary 100 or more. *Capsules* 1 inch long, tipped with the 5 styles, ovoid conical.

2. H. CORYMBOSUM, Muhl. *Spotted St. John's Wort.*

Stem erect, punctate; *leaves* clasping, oblong-oval, obtuse, covered with black dots; *sepals* ovate, acute; *petals* oblong.

Shady woods and wet meadows. June, July. *Stem* 1½ to 2 feet high, black punctate. *Leaves* 1 to 2 inches long. *Flowers* small, numerous, pale yellow, in a compact panicle or corymb. *Petals* nearly 3 times as long as the sepals, with oblong black dots. *Styles* 3, longer than the stamens. *Stigmas* orange red.

3. H. ELLIPTICUM, Hook. *Elliptic St. John's Wort.*

Stems square, simple, cymose at summit; *leaves* elliptical, obtuse, closely sessile, scarcely punctate; *cymes* nearly leafless, few-flowered, depressed; *sepals* very unequal, spreading; *styles* 3, united nearly to the top; *capsules* ovoid-globose.

Moist grounds. July. *Stem* 10 to 20 inches high, colored at base. *Leaves* 1 inch long, somewhat erect. *Flowers* orange-yellow. *Petals* acutish. *Stigmas* minute. *Pods* purplish.

4. H. PERFORATUM, L. *Common St. John's Wort.*

Stem 2-edged, branched, and corymbed; *leaves* elliptical-oval, obtuse, and with the sepals pellucid-punctate; *flowers* panicled; *sepals* lanceolate ½ as long as the petals; *styles* 3, diverging.

June—August. A pernicious plant introduced from Europe, but thoroughly naturalized, growing in pasture fields, much to the annoyance of farmers. *Stems* 1 to 2 feet high, with opposite spreading branches, erect, round, with 2 opposite, elevated lines extending between the nodes. *Flowers* numerous, deep-yellow, and in terminal panicles.

** *Stamens* 20 to 100. *Styles more or less united. Shrubby perennials.*

5. H. ADPRESSUM, Barton. *Winged St. John's Wort.*

Stem 2-winged above, shrubby at base; *leaves* linear-lanceolate or linear-oblong, sessile with pellucid punctures; *cyme* 10 to 20-flowered, naked; *sepals* very unequal, ½ as long as the oblong-obovate petals; *styles* united; *capsules* 3-celled.

Swamps. July, Aug. *Stem* 2 feet high. *Flowers* in compound cymes about ½ inch in diameter, with very numerous stamens.

6. H. NUDIFLORUM, Michx. *Naked St. John's Wort.*

Stem shrubby at base, 4-angled, winged above; *leaves* ovate-oblong or lance-oval obtuse, sessile; *cymes* compound leafless; *sepals* linear-oblong, shorter than the ovate petals; *styles* united.

Wet grounds, rare. Aug. *Stems* 1 to 2 feet high, with numerous 4-sided branches. *Leaves* thin, about 2 inches long, with minute reddish dots. *Flowers* small, and rather loose in the cyme.

7. H. PROLIFICUM, L. *Shrubby St. John's Wort.*

Stem shrubby, smooth, branching; *branches* 2-angled; *leaves* oblong-lanceolate, mostly obtuse, narrowed at base, revolute on the margin pellucid-punctate; *flowers* numerous in simple or compound clusters.

Banks of streams. July. A highly ornamented shrub 2 to 4 feet high, with much compressed branches. *Leaves* 2 inches long, ½ inch wide. *Flowers* large, orange-yellow; peduncles generally 3-flowered, the intermediate one nearly sessile.

* * * *Stamens* 5 *to* 20 *rarely* 30. *Styles short, distinct. Low and slender annuals.*

8. H. MUTILUM, L. *Small St. John's Wort.*

Stem erect, much branched, smooth, square; *leaves* ovate-oblong, obtuse, heart-shaped, clasping, 5-nerved; *cymes* leafy; *petals* shorter than the lanceolate sepals; *capsules* ovate, conical.

Damp sandy soils. June—Aug. *Stem* 6 to 12 inches high, leafy to the top. *Flowers* very small pale-yellow, solitary in the divisions of the stem.

9. H. CANADENSE, L. *Canadian St. John's Wort.*

Stem square, erect, branched; *leaves* linear, or narrowly-lanceolate, attenuate to the base, rather obtuse; *panicle* elongated, forked; *sepals* lanceolate, very acute, longer than the petals.

Low grounds, common. June—Aug. *Stems* 6 to 12 inches high. *Leaves* pellucid, and dotted with black. *Flowers* small, yellow. *Capsule* longer than the calyx and of a reddish color.

10. H. SAROTHRA, Michx. *Orange-grass.*

Stem and branches filiform, square; *leaves* minute, awl-shaped, *scales* appressed; *flowers* mostly sessile and scattered along the erect branches; *pods* slender, very acute, 1-celled.

Sandy fields and hills. June—Aug. *Stem* 4 to 8 inches high, much branched. *Leaves* very small. *Flowers* very small, yellow. *Stamens* 5 to 10. *Capsule* brown.

2. ASCYRUM. Linn. ST. PETER'S WORT.

Gr. *a. privative*, and *skuros, roughness;* the plant being smooth to the touch.

CALYX 4-sepalled, 2 outer ones smaller. PETALS 4 caducous. STAMENS many, scarcely united at base. STYLES 2 to 4, mostly distinct. CAPSULE strictly 1-celled, 2 to 3 (rarely 4) valved.—*Low, rather shrubby plants with pale black-dotted leaves and nearly pale-yellow flowers.*

I. CRUX ANDREÆ, L. *St. Andrew's Cross.*

Stems much branched at base and decumbent; *leaves* narrowly obovate-oblong, contracted at the base; *flowers* solitary or cymulose, on short pedicels; outer *sepals* ovate, inner *ones* very minute; *petals* linear-oblong; *styles* 2, at length distinct.

Sandy fields. July. *Stems* 8 to 24 inches high, 2-edged above, thickly clothed with leaves, which are variable in width. *Flowers* pale yellow on very short pedicels. *Petals* scarcely exceeding the outer sepals, approaching each other in pairs over them, in the form of St. Andrew's cross.

3. ELODEA. Adans.

Gr. *Elodes*, growing in *marshy places*.

SEPALS 5, equal, somewhat united at base. PETALS 5 deciduous, equal-sided, oblong. STAMENS 9 (rarely 12 to 15), in 3 parcels which alternate with 3 orange colored hypogynous glands. STYLES 3 distinct. CAPSULE 3-celled oblong.—*Perennial herbs, growing in marshy places, with pellucid punctate leaves, and small close clusters of purplish flowers in the axils of the leaves and at the summit.*

E. VIRGINICA, Nutt. *Virginian Elodea.*

Leaves oblong, closely sessile or clasping by a broad base, very obtuse; *filaments* united below the middle, with 3 in each set.

Marshy places, common. July—Sept. *Stem* 10 to 18 inches high, erect, branching, of a purplish hue. *Leaves* 1 to 2 inches long, ½ as wide, upper ones lanceolate, lower oblong ovate, all very obtuse, pale beneath. *Flowers* few, reddish-yellow. *Petals* about twice as long as the calyx. *Glands* ovoid, orange-colored. *Capsule* ovoid-oblong, acutish.

ORDER 19. **ELATINACEÆ.**

Small marsh annuals, with opposite leaves, membranous stipules, and axillary flowers. SEPALS 2 to 5 distinct, or slightly coherent at base, persistent. PETALS hypogynous, alternate with the sepals. STAMENS as many or twice as many as the petals. STYLES 2 to 5, very short or none; *stigmas* capitate. CAPSULES 2 to 5-celled. *Seeds* numerous, without albumen.

ELATINE. L. WATER WORT.

Gr. *elate, fir*; its minute leaves resembling those of the fir tree.

SEPALS 2 to 4, persistent. PETALS 2 to 4, hypogynous. STAMENS 2 to 8. STYLE or sessile capitate *stigmas*, 2 to 4. POD 2 to 4-celled, several-many-seeded, margins of the valves not introflexed.—*Small marshy plants with minute axillary flowers like Chickweed, but the seeds as in St. John's wort.*

E. AMERICANA, Arnott. *American Waterwort.*

Dwarf tufted; *leaves* cuneate-obovate, obtuse; *flowers* sessile, *sepals, petals, stamens* and *sessile stigmas* 2, sometimes 3. *Seeds* 6 to 8.

Edges of ponds and streams. July—Sept. *Stems* rooting and creeping in the mud, forming patches. *Leaves* ¼ inch long, entire. *Flowers* solitary, very minute, white.

ORDER 20. **CARYOPHYLLACEÆ.**—*The Pink Family.*

Herbaceous plants with opposite entire leaves, stems with swelled joints, and symmetrical 4 to 5-merous flowers. SEPALS 4 to 5 either distinct or cohering in a tube, persistent. PETALS 4 to 5 unguiculate, inserted upon the pedicel of the ovary, or without claws inserted on the outside of a fleshy disk, sometimes none. STYLES 2 to 5. *Seeds* attached to the base or central column of the 1-celled, or 2 to 5-celled capsule, numerous, rarely five, the embryo coiled round mealy albumen.

SUB-ORDER I. SILENEÆ. *The proper Pink Family.*

SEPALS united in a tubular calyx. PETALS with long claws. STAMENS 10, and with the petals borne on the stalk of the many-seeded capsule. STIPULES none.—*Flowers mostly showy.*

1. SILENE. Linn.

Gr. *sialon, saliva;* in allusion to the viscid secretion on the stems and calyx of many species.

CALYX tubular, 5-toothed, naked at the base. PETALS 5 unguiculate, mostly crowned at the orifice; limb bifid. STAMENS 10. STYLES 3. CAPSULE 3-celled at base, opening by 6 teeth at the top. EMBRYO coiled.—*Flowers solitary or in clustered cymes.*

* *Calyx inflated; flowers panicled, white. Perennial.*

1. S. STELLATA, Ait. *Starry Campion.*

Stem erect, branching, pubescent; *leaves* in whorls of 4, ovate-lanceolate taper-pointed, smooth: *flowers* in panicles: *calyx* bladder-like, pubescent, bell-shaped.

Shaded banks and woods. July, August. *Stem* 2 to 4 feet high, slender somewhat 4-sided. *Leaves* 2 to 3 inches long, ⅓ as wide, tapering to a long point sessile. *Calyx* pale-green with more deeply colored veins. *Flowers* white, borne on a large open pyrimidal panicle. *Petals* cut into a fringe at the apex, crownless.

2. S. NIVEA, Muhl. *White Catchfly. Snowy Campion.*

Stem divaricate and dichotomous above; *leaves* opposite, lanceolate or oblong, acuminate, minutely puberulent; *calyx* obtuse, bell-shaped, inflated, reticulated, subpilose; *petals* 2-cleft with a small bifid crown, reflexed; *claws* exserted beyond the calyx, nearly naked; *capsules* stiped.

"Islands in the Susquehanna, near Columbia; Muhl." June, July. *Stem* 1 to 2 feet high, smooth and slender. *Leaves* opposite, 2 inches long, and ½ an inch wide. *Flowers* white, remote, solitary, dichotomal and terminal.

** *Calyx not inflated, elongated or club-shaped. Petals crowned, red or rose-colored: perennials.*

3. S. PENNSYLVANICA, Michx. *Pennsylvania Catchfly.*

Viscidly-pubescent; *stems* numerous; *radical leaves* somewhat cuneate: those of the stem long linear; *petioles* hairy: *flowers* in somewhat 3-forked panicles; *calyx* long, tubular; *petals* slightly emarginate, subcrenate.

Gravelly hillsides. May, June. Per. *Stems* numerous, tufted, 6 to 10 inches high. *Calyx* club-shaped. *Petals* wedge-form, bright purple or nearly white.

4. S. VIRGINICA, Linn. *Virginia Catchfly.*

Viscid-pubescent; *stem* mostly erect, branching; *leaves* lanceolate; lower ones on long petioles, with long ciliæ at base; *flowers* in panicles, *petals* with long claws, broad bifid crowned.

Open Woods. May, June. *Stem* 1 to 2 feet high, single. *Flowers* few and loosely cymose, large and showy. *Calyx* oblong-cylindrical, soon obconical. *Petals* large, red, oblong, 2-cleft. *Stamens* and *pistils* exserted.

5. S. CATESBAII, Walt. *Catesby's Catchfly.*

Branching; *leaves* broad-lanceolate; *flowers* in panicles; *calyx* clavate, colored; *petals* with long claws; *limb* bifid with two lateral teeth; *lobes* acute.

Southern part of the State, not common. June. *Stem* a foot high. *Flowers* crimson, showy. Considered by some botanists as a variety of *S. Virginica.* Both De Candolle and Hooker consider it distinct. Beck.

*** *Calyx not inflated; petals crowned: annuals.*

6. S. ANTERRHINA, L. *Snap-dragon Catchfly.*

Nearly smooth; *stem* erect; *leaves* lanceolate, acute, subciliate, *upper ones* linear; *flowers* small panicled; *calyx* ovoid, smooth; *petals* small, obcordate, slightly crowned.

Dry hills. June, July. *Stem* 1 to 2 feet high, nearly smooth with some of the upper intervals viscid, simple or branching above, somewhat leafy. *Flowers* small white or pale purple, only expanding towards evening.

7. S. NOCTURNA, L. *Nocturnal Catchfly.*

Stem branched, pilose below; *leaves* pubescent, long ciliate at base; *lower ones* spatulate; *upper*, lance-linear; *flowers* appressed to the stem in a dense 1-sided spike; *calyx* cylindrical, nearly smooth, reticulated between the veins; *petals* narrow 2-parted.

Introduced and sparingly naturalized. July. *Flowers* white greenish beneath, small.

8. S. NOCTIFLORA, L. *Night-flowering Catchfly.*

Viscid pubescent; *stem* erect, branching; *lower leaves* large and spatulate; *upper ones* linear-lanceolate, acuminate; *calyx* cylindrical ventricose with long sub-appressed teeth.

Cultivated grounds. Introduced and naturalized. July. *Stem* tall, 1 to 3 feet high. *Flowers* rather large, white or purplish, expanding only in the evening and in cloudy weather, solitary in the forks, peduncled; *calyx* round, inflated, the alternate veins veinleted. *Petals* rather large 2-parted.

9. S. ARMERIA, L. *Sweet-William Catchfly.*

Smooth, glaucous: *stem* branching glutinous below each joint; *leaves* ovate-lanceolate; *flowers* in corymbose cymes; *petals* ob-cordate, crowned with the awl-shaped scales.

Escaped from gardens. Native of Europe. July—Sept. A popular garden flower. *Stem* 1 to 1½ feet high. *Flowers* numerous crimson and purple. *Calyx* elongated club-shaped.

2. SAPONARIA. Linn. SOAPWORT.

Lat. *sapo*, soap; the mucilaginous juice has been used as a substitute for soap.

CALYX tubular, 2 to 5, toothed, naked at base. PETALS unguiculate, claws equalling the calyx. STAMENS 10. STYLES 2. CAPSULE oblong, 1-celled, 4-toothed at the apex.—*Flowers cymose clustered. Petals sometimes crowned.*

1. S. OFFICINALIS, L. *Common Soapwort.*

Leaves ovate-lanceolate, ribbed, acute or obtuse; *flowers* large, in a fasciculated panicle; *calyx* cylindrical, slightly downy; *petals* crowned.

Naturalized in waste places. July—Sept. A stout plant, 1 to 2 feet high, with large flesh-color, purple or pink flowers; mostly double. Native of Europe.

2. S. VACCARIA, L. *Cow-herb. Fly-trap.*

Stem 1 to 2 feet high. *Leaves* smooth, ovate-lanceolate, partly clasping. *Flowers* in paniculate cymes. *Calyx* pyramidal, 5-angled, smooth. *Petals* not crowned, pale-red. *Capsule* 4-toothed. *Seeds* globose, black. Introduced from Europe.

CULTIVATED EXOTICS.

3. DIANTHUS. Linn. PINK.

Gr. *Dios anthos*, the flower of Jove; alluding to its pre-eminent beauty and fragrance.

CALYX tubular, 5-toothed, with 2 to 4 opposite imbricate scales at base. PETALS 5, with long claws. STAMENS 10. STYLES 2, tapering, with tapering revolute stigmas. CAPSULE cylindrical, 1-celled, 4-valved at the apex. SEEDS horizontal. EMBRYO barely curved.—*Ornamental plants, of well known beauty and value in cultivation, with very showy and fragrant flowers.*

1. D. BARBATUS. *Sweet William.*

Leaves lanceolate; *flowers* aggregate fascicled; *scales of the calyx* ovate-subulate, as long as the tube. An ornamental garden flower of the easiest culture. *Stem* 10 to 15 inches high. *Leaves* 3 to 5 inches long, ½ to 1 inch wide, narrowed to the clasping base. *Flowers* in fastigiate cymes, red or whitish, often variegated. May—July. Perennial.

2. D. CHINENSIS. *China Pink.*

Stem branched; *leaves* linear-lanceolate; *flowers* solitary; *scales* linear-leafy, spreading as long as the tube. Native of China. A beautiful species, easily distinguished by its leafy, spreading scales, and its large toothed or crenate petals. The ground color of the flowers vary from white to deep red, but the manner in which these are combined is most wonderful, variegated and striped, sometimes with black or deep velvety crimson, almost exceeds any attempts at imitation.—*Biennial.*

3. D. PLUMARIUS. *Pheasant's-Eye. Single Pink.*

Glaucous; *stem* 2 to 3 flowered; *flowers* solitary; *calyx-teeth* obtuse; *scales* ovate, very acute; *leaves* linear, rough at the edge; *petals* many-cleft, hairy at the throat. Native of Europe. Perennial. From this species, probably, originated those beautiful pinks called "Pheasant's-Eye," of which there are over 300 varieties in cultivation in Europe. *Flowers* white and purple. June—Aug.

4. D. SUPERBUS. *Superb Pink.*

Leaves linear-subulate; *flowers* fastigiate; *scales* short, ovate, mucronate; *petals* gashed in a pinnate manner. Native of Europe. Perennial. A singularly beautiful and highly fragrant species. *Stem* 1 to 2 feet high, branching and spreading, with many flowers. *Petals* white, and gashed beyond the middle, and hairy at the mouth. July—Sept.

5. D. CORYOPHYLLUS. *Carnation Pink.*

Leaves linear-subulate channeled, glaucous; *flowers* solitary; *scales* very short, ovate; *petals* very broad, beardless, crenate. *Stem* 1 to 2½ feet high, branched. *Flowers* white and crimson. This species is supposed to be the parent of all the splendid varieties of the carnation, known as the *Bizarres, Picotees, Flakes,* &c., over 400 are now enumerated by florists. July—Aug. Per.

4. LYCHNIS. Tourn.

Gr. *luknos*, a lamp; some cottony species, having been used as lampwicks.

CALYX tubular, naked at the base, 5-toothed. PETALS 5 unguiculate, limb slightly cleft. STAMENS 10. PISTILS 5. CAPSULE 1-celled or half 5-celled, scarcely stalked, opening at the top by 5 or 10 teeth. EMBRYO coiled in a ring.—*Corolla sometimes crowned.*

1. L. GITHAGO, Lam. *Corn Cockle.*

Hairy; *stem* dichotomous; *pedicels* elongated; *leaves* linear; *calyx* longer than the corolla; *petals* entire not crowned.

Grain fields. Introduced. June and July. Annual. A well known pale-green, handsome weed. *Stem* 18 to 30 inches high. *Leaves* 3 to 5 inches long, ¼ to ½ inch wide. *Flowers* large, dull purple, on long naked stalks. *Seeds* roundish angular, purplish-black.

2. L. CHALCEDONICA. *Scarlet Lychnis.*

Smoothish; *flowers* fasciculated; *calyx* cylindrical, clavate, ribbed; *petals* 2-lobed. Per. A fine garden flower, native of Russia. *Stem* 1 to 2 feet high, with dark-green, ovate-lanceolate leaves, and large dense, terminal, convex fascicles of deep scarlet flowers. There are some varieties with white flowers, and double. June and July.

3. L. CORONARIA, DC. *Mullein Pink. Rose Campion.*

Villose; *stem* dichotomous; *peduncles* long, 1-flowered; *calyx* companulate, veined. A popular perennial garden flower, native of Italy. Whole plant covered with dense wool. *Stem* 1 to 2 feet high. *Flowers* large, purple. There are varieties with white, red, and double flowers.

4. L. FLOSCUCULA. *Ragged Robbin.*

Stem ascending, dichotomous at summit; *flowers* fascicled; *calyx* companulate, 10-ribbed; *petals* in 4 deep linear segments. Native of Europe. A handsome perennial. *Stem* 1 to 2 feet high, rough angled, viscid, above. *Leaves* lanceolate, smooth. *Flowers* pink, very beautiful, generally very double, with a brown angular smooth calyx. June—Aug.

SUB-ORDER II. ALSINEÆ. THE CHICKWEED-FAMILY.

SEPALS distinct or nearly so. PETALS without claws inserted at the base of the sessile ovary; *stamens* inserted on the margin of the disk, which often coheres with the calyx; opposite the sepals when not more numerous than they.—*Low herbs without stipules.*

5. STELLARIA. Linn. STITCHWEED.

Lat. *stella*, a star; from the stellate or star-like flowers.

CALYX of 5 sepals, connected at base. PETALS 5, 2-parted. STAMENS 10, or by abortion 3 to 8. STYLES 3, sometimes 4. CAPSULE superior 1-celled, 3 to 4 valved; *valves* 2-parted, membranaceous. SEEDS usually numerous.—*Small grass-like herbs, in moist, shady places. Flowers white, in forked cymes.*

1. S. MEDIA, Smith. *Common Chickweed.*

Stem procumbent, spreading, with an alternate, lateral, hairy line; *leaves* very smooth, ovate or lanceolate, the lower on hairy petioles; *petals* 2-parted, shorter than the calyx; *stamens* 3 to 10. Annual or biennial.

Roadsides, fields, and around dwellings. March—November. *Stems* prostrate, branched, brittle, round jointed, and leafy. *Peduncles* axillary and terminal, hairy deflexed in fruit. *Flowers* small, white. Introduced.

2. S. PUBERA, Michx. *Oval-leaved Stitchwort.*

Pubescent; *stem* decumbent, spreading, marked with 2 opposite hairy lines; *leaves* all sessile, ovate-oblong, acute, ciliate; *pedicels* filiform, forked; *petals* deeply 2-cleft, longer than the calyx. Per.

Shaded rocky places; rare. April and May. *Stem* 6 to 12 inches high, diffuse and forked. *Leaves* 1 to 2 inches long, ⅓ as wide. *Flowers* large, axillary and terminal, on thread-like pedicels with 10 stamens, and 3 styles, deeply bifid.

3. S. LONGIFOLIA, Muhl. *Long-leaved Stitchwort.*

Smooth; *stem* erect, branching above, weak, square; *leaves* linear, acutish at both ends, spreading; *cymes* naked and at length lateral, peduncled, many-flowered, the slender pedicels spreading; *petals* 2-parted, becoming longer than the calyx; *calyx* 3-nerved.

Grassy places; common. June. Per. *Stem* 8 to 15 inches high, often with rough angles. *Flowers* white. *Stamens* 8 to 10.

4. S. BOREALIS, Bigl. *Northern Stitchwort.*

Stem spreading, angular, 2-forked; *leaves* oval-lanceolate, acute, 1-nerved; *petals* shorter than the calyx, or sometimes wanting; *styles* generally 4, *capsule* ovate-oblong, much longer than the calyx; *seeds* smooth.

Shaded swamps. June—Aug. Annual. A spreading flaccid plant with stems 4 to 15 inches long. *Cymes* diffuse, both terminal and axillary. *Leaves* slightly connate. *Petals* white, deeply cleft.

5. S. AQUATICA, Pollich. *Water Stitchwort.*

Nearly smooth; *stem* decumbent; *leaves* oblong acute, veined; *sepals* lanceolate, very acute, 3-veined: *petals* 2-cleft, as long as the calyx; *styles* 3; *capsule* ovoid as long as the calyx. Per.

Swampy springs. May. *Stem* 6 to 12 inches long, weak, decumbent, prolonged, bearing the naked few-flowered sessile cymes lateral. *Flowers* white, inconspicuous.

6. CERASTIUM. Linn. CHICKWEED.

Gr. *keras*, a *horn*; in allusion to the form of the capsule.

CALYX 5 (rarely 4) sepalled. PETALS 5, bifid or emarginate. STAMENS 10, sometimes 4 or 6, the alternate ones short. STYLES 5. CAPSULE superior, cylindrical or oblong, opening at the apex by 10 teeth, many-seeded.—*Flowers white in terminal cymes.*

* *Petals about as long as the calyx; pods long and curved.*

1. C. VULGATUM, L. *Mouse-ear Chickweed.*

Hairy, pale green, seldom clammy, in tufts; *leaves* ovate or obovate, obtuse; *flowers* in sub-capitate clusters; *sepals* lanceolate, acute, in fruit as long as the peduncles; *petals* oblong, emarginate, scarcely longer than the calyx. Annual.

Waste places, fields and hills. May—Aug. *Stem* 6 to 10 inches high, sub-erect. *Flowers* white, the petals appearing in 10 segments. *Capsule* oblong, tapering, twice as long as the calyx. Introduced from Europe.

2. C. VISCOSUM, L. *Clammy Mouse-ear Chickweed.*

Hairy viscid, spreading, deep green; *stems* numerous, erect; *leaves* lanceolate-oblong, rather acute; *flowers* in loose cymes; *sepals* oblong-ovate, obtuse, in point shorter than the peduncles; petals oblong, emarginate, scarcely larger than the calyx. Biennial.

Fields and waste grounds. May—Aug. *Stem* 6 to 12 inches high. *Leaves* ½ to ¾ inches long, ⅓ as broad; *root leaves* somewhat spatulate. *Flowers* white. Probably introduced.

** *Petals much longer than the calyx.*

3. C. NUTANS, Raf. *Nodding Chickweed.*

Viscid and pubescent; *stem* erect, slender grooved, diffusely branched; *leaves* lance-linear, elongated, distant; *panicle* much elongated, divaricate, many-flowered, with long filiform pedicels; *petals* oblong, bifid, at the tip, twice as long as the calyx; *capsule* nodding on the stalks, curved upwards, 3 times as long as the calyx.

Moist places. June. Annual. *Stem* 8 to 20 inches high, branched from the base. *Leaves* 1 to 2 inches long ¼ as wide. *Flowers* white, terminal, in a loose dichotomous panicle. Whole plant pale-green.

4. C. OBLONGIFOLIUM, Tourn. *Oblong-leaved Chickweed.*

Stem ascending, villous, many-flowered; *leaves* oblong-lanceolate and ovate, mostly obtuse; *peduncles* clammy-hairy; *petals* obovate, 2-cleft, twice as long as the oblong obtuse sepals; *capsule* twice as long as the calyx.

Rocky places. May, June. Per. *Stem* 6 to 10 inches high, stout. *Leaves* ¾ to 1 inch long, ⅓ as wide, tapering from base to an acute or obtuse apex. *Flowers* larger than either of the foregoing, white, 7 to 15 in a 2 or 3-forked cyme.

5. C. ARVENSE, L. *Field Chickweed.*

Stem ascending or erect, tufted, downy, slender, naked and few-flowered; *leaves* linear-lanceolate, obtuse, the lowest spatulate, more or less hairy; *peduncles* elongated; *petals* more than twice the length of the calyx; *capsule* oblong, scarcely longer than the calyx.

Dry or rocky places. May, June. Perennial. *Stem* 4 to 8 inches high. *Leaves* ¾ to 1¼ inches long, very narrow. *Flowers* white, rather large, 2 to 3 on terminal pedicels. *Petals* deeply cleft.

7. ARENARIA. Linn. SAND WORT.

Lat. *arena*, sand; in which the species mostly grow.

SEPALS 5, rarely 4. PETALS 5, entire. STAMENS 10, or fewer by abortion. STYLES 3, opposite the outer sepals. CAPSULE 3-valved, 1-celled, many-seeded, dividing from above.—*Flowers terminal, solitary or cymose, perfect, white.*

1. A. STRICTA, Michx. *Upright Sandwort.*

Erect, or spreading from a small root, smooth; *leaves* subulate-linear, with many others clustered in the axils; *cyme* diffuse, naked, many-flowered; *sepals* ovate, very acute, 3-ribbed, ½ as long as the petals; *capsule* ovate.

Rocks and dry banks. May, June. *Stems* 8 to 10 inches high. *Leaves* ½ to ¾ inches long, very narrow and acute. *Flowers* white. Per.

2. A. SERPYLLIFOLIA, L. *Thyme-leaved Sandwort.*

Roughish, diffusely branched; *leaves* ovate, acute, sessile, subcilliate; *sepals* hairy, lanceolate, pointed, 3 to 5-nerved, longer than the oval petals; *capsule* ovate, 6-toothed equalling the calyx.

Sandy fields. May—Aug. Annual. *Stems* numerous, downy, with reflexed hairs, 3 to 8 inches high. *Flowers* white, on terminal and axillary peduncles. Introduced.

3. A. LATERIFLORA, L. *Side-flowering Sandwort.*

Erect, sparingly branched, minutely pubescent; *leaves* oval or oblong, obtuse; *petals* twice as long as the sepals.

Shady gravelly banks and woods; not common. June. Per. A slender upright species. *Stem* 5 to 10 inches high. *Leaves* ½ to 1 inch long, ½ as wide, on very short peteoles. *Peduncles* terminal and lateral, 2 (rarely 3 to 4) flowered, one of the pedicels with 2 bractioles, near the middle. *Flowers* white, ½ inch broad. *Capsule* ovoid, obtuse; *valves* 2-cleft. *Mœhringia* of Beck and Torrey.

8. SAGINA. Linn. PEARLWORT.

Lat. *sagina*, food or nourishment, which fattens.

SEPALS 4 to 5, united at base. PETALS 4 to 5, undivided often indistinct or none. STAMENS 4 to 10. STYLES 4 to 5, alternate with the sepals. CAPSULE 4 to 5-valved, 1-celled, many-seeded.—*Small matted herbs, with thread-like or awl-shaped leaves and minute solitary flowers.*

1. S. PROCUMBENS, L. *Procumbent Pearlwort.*

Stem procumbent, smooth, branched; *leaves* linear-mucronate; *petals* much shorter than the calyx.

Borders of springs and streams. May—July. Perennial. *Stems* 2 to 4 inches high, diffuse and rooting at the lower joints. *Leaves* thread-form narrowly linear; *lower ones* connate. *Peduncles* solitary, longer than the leaves. *Flowers* small, white and greenish. *Stamens* 4 to 5. *Petals* shorter than the calyx.

2. S. APETALA, L. *Annual Pearlwort.*

Stems erect, or procumbent only at base, slightly pubescent; *leaves* subulate; *flowers* alternate.

Sandy fields. May, June. Annual. *Stems* numerous, filiform, 2 to 4 inches high. *Leaves* almost bristle-form. *Pedicels* elongated, ascending. *Sepals* and *stamens* 4. *Petals* 4, very minute or none.

9. MOLLUGO. Linn. INDIAN CHICKWEED.

SEPALS 5, united at base. PETALS none. STAMENS 3 to

5, sometimes 10. STYLES 3, short. CAPSULE 3-valved, 3-celled, the partitions breaking away from the many-seeded axis.—*Low homely annuals, with apparently verticillate leaves, and small white solitary flowers.*

M. VERTICILLATA, L. *Carpet-weed.*

Stems prostrate, dichotomous; *leaves* cuneaform or spatulate; *pedicels* 1-flowered, subumbellate.

Cultivated grounds, pavements, &c.; common. June—Sept. A small prostrate, annual. *Stems* 4 to 12 inches long, spreading in all directions. At every joint stands a whorl of wedge-shaped or spatulate leaves of unequal size, usually 5 in number. *Flowers* few, solitary, on short slender stalks, small, white.

SUB-ORDER III. ILLECEBREÆ. KNOT-WORT FAMILY.

Small weeds differing from Alsineæ only in having scabrous stipules, flowers with inconspicuous petals, the uppermost leaves rarely alternate, and the 1-celled pods sometimes 1-seeded.

10. ANYCHIA. Michx.

Gr. *onux*, the *finger nails;* a supposed remedy for the whitlow.

SEPALS 5, scarcely concave, indistinctly mucronate on the back, greenish. PETALS none. STAMENS 2 to 3, rarely 5. STYLES 2, very short. UTRICLE 1-seeded, enclosed in the sepals.—*Small annual herbs, with many times forked branches, stipulate leaves, and minute white flowers.*

A. DICHOTOMA, Michx. *Forked Chickweed.*

Stem erect or spreading, dichotomously branched; *leaves* varying from lanceolate to elliptical, somewhat petioled; *flowers* solitary, terminal and axillary.

Dry soils. July, Aug. *Stem* 6 to 12 inches high, round, slender, pubescent above with forked filiform branches. *Leaves* small, those of the stem opposite, the branches alternate. *Flowers* very minute, in the forks of the stem greenish. A variable plant.

11. SPERGULA. Linn. SPURREY.

Lat. *spergo*, to scatter; from the dispersion of the seeds.

SEPALS 5, nearly distinct. PETALS 5, large, entire. STAMENS 5 to 10. STYLES 5. CAPSULES ovate, 5-celled, 5-valved, the valves opposite the sepals.—*Annual herbs, with narrow stipulate leaves in whorls, and cymose white flowers.*

1. S. ARVENSIS, L. *Corn Spurrey.*

Leaves awl-shaped-linear, numerous in the whorls, with minute interposed stipules, often clustered in the axils; *flowers* in a compound cyme, slender, stalked.

Grain-fields, and sandy places. June—Aug. Introduced. *Stem* 8 to 12 inches high, swelling at the joints. *Leaves narrow. Cyme* forked, the terminal (central) peduncles bending down as the fruit ripens. *Petals* white, longer than the calyx. *Capsule* twice as long. *Seeds* numerous with a narrow margin.

12. SPERGULARIA. Persoon.

SEPALS 5. PETALS 5, entire. STAMENS 2 to 10. STYLES and valves of the many-seeded capsule 3, or if 5 the valves alternate with the sepals.—*Low herbs, with fleshy opposite leaves, scaly membranous stipules, and small red or rose colored flowers.*

S. RUBRA, Pers. *Common Sandwort.*

Stem prostrate, pilose much branched; *leaves* narrow, linear, or filiform, somewhat fleshy, shorter than the internodes; *sepals* lanceolate, somewhat obtuse, scarious on the margin; *seeds* compressed, roughish, not margined.

Sandy fields, near brackish water. June—Sept. Annual. *Stems* 3 to 10 inches long, at first erect at length diffuse, smooth or pubescent. *Leaves* variable in length and form. *Flowers* small, red, axillary and solitary, in terminal leafy cymes or racemes. A very variable plant. *Arenaria rubra* of Linn.

SUB-ORDER IV. SCLERANTHEÆ.

Small diffusely branched plants, with opposite leaves, without stipules and small flowers. Sepals united into an indurated tube surrounding the utricle; the stamens inserted at the throat.

13. SCLERANTHUS. Linn. KNAWEL.

Gr. *skleros,* hard, and *anthos,* flower; from the hardened calyx tube.

SEPALS 5 united below in an indurated cup, inclosing the 1-seeded utricle. PETALS none. STAMENS 5 or 10. STYLES 2 distinct.—*Homely and inconspicuous little weeds, with obscure greenish clustered flowers.*

S. ANNUUS, L. *Annual Knawel.*

Depressed tufted. *Stems* spreading, slightly pubescent; *leaves* awl-shaped, somewhat united at the base; *flowers* nearly sessile; *stamens* 10; *calyx* of the fruit spreading, acute.

Waste places and sandy fields, introduced. July. Annual. *Stems* numerous, much branched in a dichotomous manner, forming tufts, 3 to 6 inches in diameter. *Flowers* very small, green in axillary leafy clusters.

ORDER 21. **PORTULACACEÆ.**

Succulent or fleshy herbs, with alternate or opposite entire leaves, destitute of proper stipules, and usually ephemeral flowers. CALYX mostly of 2 sepals. COROLLA of 5 petals. STAMENS 8 to 20. STYLES 3 to 6 united below, stigmatic along the inner side. CAPSULE 1-celled. SEEDS attached to a central placenta; *albumen* mealy.

1. PORTULACA. Tourn. PURSLANE.

SEPALS united to the ovary below, 2-parted. STAMENS 8 to 20. STYLE mostly 5-cleft. CAPSULE globular, many-seeded, opening transversely, the upper part (with the upper part of the calyx) separating like a lid.—*Low herbaceous fleshy annuals, with scattered leaves, and some species with showy brilliant flowers expanding only in sunshine.*

1. P. OLERACEA, L. *Common Purslane.*

Leaves wedge-form, obtuse, fleshy, smooth; *axils* geniculated, naked; *flowers* sessile; *stamens* 10 to 12.

Gardens, and cultivated grounds; common. May—Aug. *Stem* fleshy, much branched and spreading, smooth. *Leaves* and *stems* of a reddish-green color. *Flowers* in clusters, axillary and terminal, small, pale-yellow. Introduced.

2. P. PILOSA, *Scarlet-flowered Purslane.*

Stems ascending, much branched; *branches* sub-erect, enlarged upwards; *leaves* linear, obtuse, the axils villose with long woolly hairs; *flowers* terminal, sessile, 1 or few together, surrounded by an irregular circle of leaves and dense tufts of wool; *petals* obovate; *stamens* about 15. A very delicate popular garden plant with showy crimson and scarlet flowers, 1½ inches in diameter. Native of S. Africa.

2. CLAYTONIA. L. SPRING-BEAUTY.

In honor of *John Clayton,* a botanist of Virginia.

SEPALS 2, ovate or roundish, persistent. PETALS 5 emarginate or obtuse. STAMENS 5, inserted on the claws of the petals. STYLE 3-cleft. CAPSULE 1-celled, 3-valved, 2 to 5-seeded.—*Our species are small, fleshy, delicate perennials, sending up simple stems, in early spring, with a pair of opposite leaves, and a loose raceme of pretty flowers.*

1. C. VIRGINICA, L. *Virginian Spring-beauty.*

Leaves mostly 2, linear, or lance-linear, elongated and attenuated into a petiole below; *raceme* simple, loose, at length elongated; *peduncle* slender, nodding; *petals* obovate, mostly emarginate or retuse.

Low moist grounds. March—May. *Tubercle* as large as a hazle-nut, deep in the ground. *Scape* 6 to 8 inches long, weak with a pair of opposite narrow leaves, 3 to 5 inches long. *Flowers* 6 to 10 rose-colored, with deeper colored veins.

2. C. CAROLINIANA, Michx. *Spring-beauty.*

Leaves ovate-lanceolate or oval, somewhat spatulate, or abruptly decurrent into a petiole; *peduncles* slender, nodding; *sepals* and *petals* very obtuse.

Woods and rocky hills; common. April, May. *Root* a compressed brown tubercle, buried at a depth into the ground, equal to the height of the plant. *Root-leaves* very few, if any, spatulate. *Stem* weak, 4 to 8 inches high, with a pair of opposite leaves half-way up. *Flowers* in a terminal cluster, white with a slight tinge of red and beautifully pencilled with purple lines.

3. TALINUM. Adans.

SEPALS 2, ovate, concave, deciduous. PETALS 5, sessile. STAMENS 10 to 30, inserted with the petals into the torus. STYLE filiform, 3-cleft at the apex. CAPSULE sub-globose, 3-celled at the base, when young, 3-valved, many-seeded.—*Fleshy perennials.*

R. TERETIFOLIUM, Pursh. *Cylindrical-leaved Talinum.*

Stem simple or branched, short and thick; *leaves* subulate, crowded at the summit of the stem, on short branches; *peduncles* long and naked; *flowers* in a dichotomous cyme.

Rocks, Chester county. Dr. Darlington! June—Aug. *Roots* a few coarse fibres from the base of a short thick firm but somewhat fleshy perennial stem. *Branches* 1 to 3 inches long. *Leaves* 1 to 2 inches long, incurved, cylindrical, fleshy. *Bracts* ovate-lanceolate, small. *Peduncles* 5 to 8 inches high. *Flowers* small, bright-purple, expanding only for a day.

ORDER 22. **MALVACEÆ.**—*Mallow Family.*

Herbs or shrubs, with alternate stipulate leaves, and regular flowers, with numerous stamens, monodelphous in a column. FLOWERS axillary, showy, often with an involucel at the base. SEPALS generally 5, more or less united at the base, persistent. PETALS 5, cohering by their short claws with the tube of filaments. STAMENS indefinite, monodelphous: *anthers* 1-celled bursting transversely. PISTILS several, with the ovaries united into a ring, or forming a several-celled capsule. SEEDS with little albumen. *Embryo* curved.

1. MALVA. Linn. MALLOW.

Gr. *malake, soft;* on account of the soft mucilaginous properties.

CALYX 5-cleft, with a 3-leaved involucel at the base, like an outer calyx. CARPELS many, 1-celled, 1-seeded arranged circularly.—*Flowers perfect.*

1. M. AMERICANA, Muhl. *American Mallow.*

Leaves ovate, crenate; *stipules* oblong-linear; *peduncles* axillary, 1-flowered.

Southern part of the State. Annual. *Stem* 12 to 18 inches high, sparingly branched, clothed with white hairs above. *Leaves* hairy on the veins beneath, nearly smooth above. *Petioles* 1 inch long. *Bracteole* bristly. *Carpels* hispid, in a depressed, globular head. *Petals* yellow, twice as long as the calyx. T. & G.

2. M. ROTUNDIFOLIA, L. *Low Mallow.*

Stem prostrate; *leaves* roundish-cordate, obtusely 5 to 7-lobed, crenate, long petioled; *flowers* axillary; *corrola* twice the length of the calyx, notched at the end.

Cultivated grounds; common. June—Oct. Per. *Root* fusiform. *Stems* numerous, a foot or more long. *Peduncles* axillary, aggregate. *Petals* pale pink with darker veins, deeply notched at the end. *Fruit* depressed, composed of the numerous carpels arranged circularly. Extensively naturalized.

3. M. SYLVESTRIS, L. *High Mallow.*

Stem erect, branched, hairy; *leaves* large roundish, with 5 to 7 somewhat acute lobes; *flowers* axillary, 3 to 4 together; *peduncles* and *petioles* hairy; *petals* ob-cordate, 3 times as long as the calyx.

Waste places, escaped from gardens, sparingly naturalized. June—Oct. Per. *Stem* 2 to 3 feet high. *Flowers* reddish purple, with veins of a darker hue. Whole plant emollient and mucilaginous. Native of Europe.

4. M. CRISPA, L. *Curled or Crisped-leaved Mallow.*

Stem erect; *leaves* angular-lobed, dentate, crisped, smooth; *flowers* axillary, sessile. A tall, straight, simple, erect plant from Syria. Gardens, almost naturalized. *Stem* 5 to 6 feet high. *Leaves* large, roundish, margin abundantly crisped and curled. *Flowers* small, inconspicuous, white. June, August.

5. M. MOSCHATA, L. *Musk Mallow.*

Stem erect; *radical leaves* reniform, incised; *stem leaves* many-parted, the segments linear; *peduncles* and *calyx* hairy. Native of Britain. *Stems* 2 feet high, branched. *Flowers* large and handsome, rose-colored and white. The whole plant emits a musk-like odor in favorable weather. July. Perennial.

2. ALTHÆA. Linn. HOLLYHOCK.

Gr. *althea*, to cure.

CALYX 5-cleft surrounded at base by a 6 to 9 cleft involucre. CARPELS many, 1-seeded, indehiscent, arranged circularly around the axis.

1. A. OFFICINALIS, L. *Marsh Hollyhock.*

Stem erect; *leaves* ovate, or slightly heart-shaped, toothed, sometimes 3-lobed, clothed with velvety down; *peduncles* axillary, many-flowered, much shorter than the leaves.

A European plant, cultivated in gardens and in some places naturalized. Aug.—Sept. Per. *Stem* 2 to 3 feet high, erect, firm, very downy. *Leaves* alternate. *Flowers* large, axillary and terminal, pale purple. Medicinal.

2. A. ROSEA, Cra. *Hollyhock.*

Stem erect, hairy; *leaves* cordate, 5 to 7 angled, rugose; *flowers* axillary, sessile. Native of China. Annual and biennial. *Flowers* large, with numerous varieties of single, double and semi-double flowers of various shades of coloring, as white, crimson, dark red, purple, brownish-black, yellow, straw-color, &c. Cultivated in gardens.

3. A. FICIFOLIA, Cav. *Fig-leaved Hollyhock.*

Stems erect, hairy; *leaves* palmate, 7-lobed beyond the middle, lobes oblong, obtuse, angularly toothed. Native of the Levant. Cultivated for ornament. *Flowers* large, orange-colored.

3. HIBISCUS. Linn.

CALYX 5-cleft, or 5-toothed, surrounded by a many-leaved involucel. ANTHER-bearing column prolonged, the apex generally divided into 5 slender styles bearing the 5 globular stigmas. CAPSULE 5-celled, 5 or many-seeded, opening into 5 valves which bear the partition on their middle.—*Herbs or shrubs, usually with large and showy flowers.*

1. H. MOSCHEUTOS, L. *Marsh Hibiscus.*

Herbaceous, simple, erect; *leaves* ovate, pointed, toothed, the lower 3-lobed, whitish-tomentose beneath, somewhat scabrous-pubescent above; *peduncles* and *petioles* often united; *calyx* tomentose.

Borders of marshes, near Harrisburg. Aug. Per. *Stem* 3 to 6 feet high, stout. *Leaves* 4 to 6 by 3 to 4 inches, often with 2 lateral lobes. *Flowers* large, 5 inches in diameter, pale rose-purple, or white with a crimson centre. Showy.

2. H. MILITARIS, Willd. *Halbert-leaved Hibiscus.*

Smooth; *lower leaves* ovate-heart-shaped, toothed, 3-lobed; *upper leaves* halbert-form, the short lateral lobes approaching at the base, the middle one prolonged and acuminate; *peduncles* slender; *fruiting calyx* inflated; *seeds* hairy.

River banks. Aug. Per. *Stem* 3 to 4 feet high. *Flowers* pale rose-colored, with a purplish centre 3 to 4 inches in diameter.

Cultivated for ornament.

3. H. SYRIACUS. *Syrian Hibiscus.*

Leaves cuneaform, ovate, 3-lobed, dentate; *pedicels* scarcely longer than the petioles; *involucel* about 8-leaved. A beautiful, hardy, free-flowering shrub from Syria, 5 to 10 feet high. *Flowers* in the different varieties purple, red, white and striped, both single and double. July. Sometimes erroneously called "Rose of Sharon."

4. H. TRIONUM. *Flower of an hour.*

Somewhat hairy; *upper leaves* deeply 3-parted, with lanceolate divisions, the middle one much the longest; *lower leaves* undivided, dentate; *calyx* inflated, membranaceous, with bristly ribs, 5-winged at the summit; *seeds* rough. Annual. Native of Italy. *Stem* 1 to 2 feet high. *Flowers* numerous but soon withering. *Petals* of a rich chlorine yellow, the base deep brown, one variety has flowers 2 inches in diameter, continuing expanded nearly all day.

5. H. COCCINEUS, Walt. *Scarlet Hibiscus.*

Very smooth; *leaves* palmate, 5-parted; *lobes* lanceolate, acuminate, remotely serrate alone; *corolla* expanding; *capsule* ovoid, smooth. A splendid flower, native of Georgia, sometimes cultivated in our gardens. *Root* perennial. *Stem* herbaceous, 5 to 9 feet high. *Flowers* of a bright carmine red. *Petals* slender at the base, 4 to 6 inches long. *Column* still longer, slender and terete. July—Oct.

6. H. MANIHOT, L. *Hand-leaved Hibiscus.*

Leaves palmately divided into 5 to 7 broad-linear, acuminate, scarcely dentate lobes; *peduncles* and *involucel* hispid; *involucel* bracts 5 to 7, ovate or lanceolate, acutish, persistent, entire; *calyx* split on one side; *capsule* densely hirsute, acuminate. Native of the Western States. A beautiful perennial plant, 3 to 5 feet high. *Leaves* cordate, the *lobes* 5 to 10 inches long, ½ to 1½ wide, separated to near the base, about as long as the petioles; *teeth* largest near the summit. *Flowers* sulpher-yellow, purple in the centre. *Petals* 2 to 4 inches long. July, Aug. Per.

4. ABUTILON. Tourn. INDIAN MALLOW.

CALYX 5-cleft, without an involucel, often angular. STYLES 5 to 15. CARPELS 5 to 15 arranged circularly, coherent, spreading at the summit, where each splits open along the inner edge. SEEDS about 3 in each carpel.—*Flowers in the axils of the heart-shaped leaves.*

1. A. AVICENNÆ, Gærtn. *Indian Mallow. Velvet Leaf.*

Leaves roundish-heart-shaped, acuminate, dentate, velvety-tomentose; *peduncles* shorter than the leaf-stalks, solitary; *carpels* about 15, 3-seeded, beaked, the beaks splitting in two.

Waste grounds. Introduced from India; naturalized. Annual. July, August. *Stem* 3 to 5 feet high, with spreading branches. *Flowers* in the axils of the leaves, orange-yellow, near 1 inch in diameter.

5. SIDA. Linn.

CALYX 5-cleft, without an involucel. STYLES 5 or more, the ripe fruit separating into as many 1-seeded carpels, each splitting open at the top, arranged circularly.

1. Flowers perfect. Stigmas terminal, minutely capitate.

1. S. SPINOSA, L. *Prickly Sida.*

Stem rigid, branched from the base, minutely pubescent; *leaves* ovate-lanceolate, toothed, with the tubercles at the base spiny; *pedicels* axillary, solitary, shorter than the stipules and petioles; *fruit* separating into five 2-beaked carpels, opening between the beaks.

Waste places, roadsides; common. July and August. Annual. *Plant* bushy, 1 to 2 feet high. *Leaves* 1 inch long and ½ as wide, mostly obtuse at each end. *Petals* obovate, yellow, of short duration.

2. S. NAPÆA, Willd. *Smooth Sida.*

Stem slender, smooth; *leaves* palmately 5-lobed, smooth; *lobes* oblong-linear, acuminate, coarsely toothed; *carpels* 10, acuminate, awnless.

Shaded rocky places; rare. July. Per. *Stems* angular, 3 to 5 feet high. *Leaves* on short petioles, cordate; *lobes* 2 to 4 inches long, ½ to ¾ wide. *Floral leaves* much smaller. *Peduncles* axillary and terminal, long and slender, somewhat leafy, the divisions somewhat 4-flowered. *Flowers* nearly ½ inch in diameter. *Petals* white, twice as long as the calyx.

2. NAPÆA. Clayton. Flowers diœcious: styles stigmatic along the inside.

3. S. DIOICA, Willd. *Diœcious Sida.*

Leaves palmately 7 to 9 lobed; *lobes* lanceolate, incisely toothed; *peduncles* many-flowered, bracteate, sub-corymbed; *staminate flowers* entirely destitute of pistils; the *fertile* with a short column of filaments but no anthers; *carpels* 8 to 10, pointless in a roundish depressed head.

Stony grounds; not common. July—Sept. Per. A tall and roughish herb, 4 to 5 feet high, with very large 7 to 9-parted lower leaves, with the pointed lobes pinnatifid cut and toothed, and small white flowers in panicled clustered corymbs.

ORDER 23. **TILIACEÆ.**—*Linden Family.*

Trees or shrubs, with simple, stipulate, alternate leaves and axillary flowers, usually perfect. SEPALS 4 to 5, deciduous, valvate. PETALS 4 to 5, entire, hypogynous, rarely wanting, imbricated in the bud. STAMENS numerous, usually polydelphous; ANTHERS 2 celled. DISK often with 4 to 5 glands at the base of the petals. OVARY of 2 to 10 united carpels; STYLES 1; STIGMAS as many as the carpels. FRUIT capsular, 2 to 5 celled; SEEDS solitary or numerous, with fleshy albumen.

1. TILIA. Linn. LINDEN.

SEPALS 5. PETALS 5, spatulate-oblong. STAMENS numerous; *filaments* cohering in 5 clusters with each other, or free. PISTIL with a 5-celled ovary, and 2 half-anatropous ovules in each, a single style, and a 5-toothed stigma. FRUIT a sort of woody globular nut, becoming 1-celled and 1 to 2 seeded.—*Fine trees with heart-shaped leaves and small cymes of flowers, hanging on an axillary peduncle which is united to a leaf-like bract.*

1. T. AMERICANA, L. *Basswood.*

Leaves deeply cordate, abruptly acuminate, acutely serrate, coriaceous, smooth; *flowers* in cymes; *petals* truncate at the apex, crenate; *style* as long as the petals; *fruit* ovate, somewhat ribbed.

Rich woods. June. A fine tree from 60 to 70 feet high, the trunk straight and naked more than half this height, and 2 to 3 feet in diameter. *Leaves* 4 to 5 by 3 to 4 inches: those of the young shoots often more than twice this dimension. *Bracts* yellowish, linear-oblong. *Flowers* yellowish-white, honey-bearing, fragrant. The wood is white and soft, and much used by cabinet and coach makers.

2. T. LAXIFLORA, Michx. *Loose-flowered Linden.*

Leaves cordate, gradually acuminate, serrate, membranaceous, smooth; *flowers* in loose panicles; *petals* emarginate; *styles* longer than the petals; *fruit* globose.

Near the sea coast. May. Shrubby or arboreous. A very distinct species, though generally confounded with the former. *Pursh. Beck.*

3. T. ALBA, Michx. *White Linden.*

Leaves obliquely-cordate, abruptly acuminate, whitish and thinly pubescent beneath, with veins of the same hue, smooth and bright green above, acuminately serrate: *petals* emarginate; *scales* spatulate; *styles* nearly smooth.

Woods and mountains. June. Trunk 30—40 feet high, 1 to 1½ feet in diameter; *branches* with a smooth silvery bark. *Leaves* 3 to 5 often 8 inches in diameter, slightly oblique, and with reddish hairs in the axils of the veins beneath. *Flowers* larger and whiter than in the other species.

4. T. EUROPEA, L. *European Linden.*

A common ornamental tree, which is planted along the streets of our cities, is easily distinguished from our native species by the absence of the petal-like scales among the stamens.

ORDER 24. LINACEÆ.

Herbs with regular hypogynous flowers, tetramerous and pentamerous throughout, strongly imbricated calyx and convolute petals. SEPALS 3 to 5, persistent. PETALS as many as the sepals, unguiculate. STAMENS as many as the petals, and alternate with them at the base into a hypogynous ring, which is often toothed. OVARY of as many cells as sepals and styles; STIGMA capitate. SEEDS solitary in each cell, compressed, suspended.

1. LINUM. Linn. FLAX.

SEPALS, PETALS, STAMENS, and STYLES 5. CAPSULE of 5 united carpels and only 5 celled, with 2 seeds hanging from the summit of each; but each cell is incompletely or completely divided into two by a false partition which projects from the back of the carpels, thus becoming 10-celled. SEEDS ovate compressed, mucilaginous.—*Herbs with a fibrous bark, simple and sessile entire leaves, alternate or often opposite, without stipules, and terminal corymbose or panicled flowers.*

1. L. VIRGINIANUM, L. *Wild Flax.*

Radical leaves ovate and spatulate; those of the stem linear-lanceolate, alternate; *flowers* small, scattered on the corymbose or panicled branches, on very short peduncles, turned to one side; *sepals* ovate, pointed, smooth.

Woods and fields. June, Aug. Biennial or per. *Stem* 1 to 2 feet high, slender, smooth, leafy, terete. *Leaves* ¾ inch long, ⅛ wide, with 1 distinct vein. *Flowers* 4 to 6 lines in diameter, yellow, on short pedicels. *Sepals* 1-veined.

Variety *diffusum*. Woods. *Stem* angular, diffusely branched; *branches* and lanceolate leaves spreading; *flowers* very small, yellow. Wet places, along ditches. Quite different in habit.

2. L. USITATISSIMUM, L. *Common Flax.*

Stem branching above; *leaves* alternate, linear-lanceolate, acute; *panicle* corymbose; *sepals* ovate, acute, 3-veined at the base; *petals* crenate; *capsule* roundish, acuminate.

Cultivated and somewhat naturalized about fields. June, July. Annual. *Stem* 1 to 2 feet high. *Leaves* distinct 3-veined. *Flowers* large, purplish-blue. A useful plant, from the strong fibres of the bark *linen* is manufactured, and the seeds yield *linseed oil*, so extensively used in mixing paint, printer's ink, &c.

ORDER 25. GERANIACEÆ.—*Crane's-bill Family.*

Plants with mostly regular, hypogynous, pentamerous flowers, imbricated sepals, and convolute petals. LEAVES opposite (at least the lower ones), mostly stipulate, petiolate, palmately-veined. FLOWERS on peduncles, terminal or opposite the leaves, sometimes axillary. SEPALS 5, persistent, veined, one sometimes saccate or spurred at base. PETALS 5, unguiculate, hypogynous or perigynous. STAMENS usually monodelphous, hypogynous, 2 or 3 times as many as the petals. FRUIT formed of carpels cohering around the axis, having a membranaceous pericarp and terminated by an indurated style, which finally curves upward carrying the pericarp with it. SEEDS solitary, without albumen.

1. GERANIUM. Linn. CRANE'S-BILL.

Gr. *geranos*, a crane; the beaked fruit resembling a *crane's bill.*

SEPALS and PETAS 5, regular. STAMENS 10, all fertile, the alternate ones longer, and with nectariferous scales at the base. CARPELS with long awns, at length seperating elastically from the summit to the base; *awns* smooth internally.—*Herbaceous plants, rarely shrubby at base. Peduncles 1, 2 or 3 flowered.*

1. G. MACULATUM, L. *Spotted Geranium. Crane's bill.*

Stem somewhat angular, erect, dichotomous, setosely pubescent; *leaves* 3 to 5-parted; *lobes* wedge-shaped and entire at base, incisely serrate above; *radical leaves* on long petioles, upper opposite, on short petioles; *sepals* mucronately awned; *petals* entire.

Open woods; common. May, June. Per. *Stem* 10 to 20 inches high. *Leaves* 2 to 3 inches in diameter, cleft ¾ way down, 2 at each fork. *Flowers* mostly in pairs on unequal pedicels, large, purple. *Root* powerfully astringent. *Medicinal.*

2. G. PUSILLUM, L. *Small-flowered Geranium.*

Stems procumbent, slender, minutely pubescent; *leaves* rounded, kidney-form, 5 to 7-parted, the divisions mostly 3-cleft; *peduncles* short, 2-flowered; *sepals* awnless, about as long as the emarginate calyx.

Sandy soils. May—July. *Stems* 1 foot long, much branching, covered with short deflected hairs. *Leaves* opposite, divided almost to the base. *Peduncles* axillary, forked, bearing 2 purplish-red flowers, much smaller than the preceding. Introduced. Annual.

3. G. CAROLINIANUM, L. *Carolina Crane's bill.*

Stem diffusely branched; *leaves* deeply 5-parted; *lobes* incisely toothed 3 to 5-cleft; *peduncles* crowded towards the top; *petals* notched, as long as the calyx; *carpels* hairy.

Fields and hills. May—July. *Stems* pubescent, diffuse, 8 to 15 inches long, swelling at the joints. *Leaves* ¾ to 1½ inches in diameter, hairy. *Flowers* small, rose-colored or nearly white, in pairs and somewhat fasciculate. Biennial.

4. G. ROBERTIANUM, L. *Herb Robert.*

Stem diffuse, hairy; *leaves* 3 to 5-parted to the base; *leaflets* somewhat pinnatifid, segments somewhat mucronate; *peduncles* long, 2-flowered; *sepals* awned, shorter than the entire petals.

Rocky places and shaded ravines. June—Oct. Annual. *Stem* reddish, with long diffuse weak branches. *Leaves* on long petioles somewhat hairy, 1½ to 3 inches in diameter, with pinnatifid segments. *Flowers* small, pale purple, beautifully lined with darker shades. *Capsule* small, rugose, keeled. *Seeds* smooth. The whole plant is very fetid.

The genus *Pelargonium* embracing more than 300 species of shrubby and herbaceous plants, with innumerable varieties of magnificent flowers, nearly all natives of the Cape of Good Hope, are embraced in this order. Many of which are cultivated in our green houses and conservatories.

ORDER 26. **OXALIDACEÆ.**—*The Wood Sorrel Family.*

Plants with sour juice, compound leaves, and regular flowers. SEPALS 5, persistent, equal. PETALS 5, equal, unguiculate, with a twisted æstivation. STAMENS 10, usually more or less monodelphous, those opposite the petals longest. STYLES 5, filiform; *stigmas* capitate. FRUIT capsular, membraneous, with 5 cells, and from 5 to 10 valves. SEEDS few, with a fleshy integument, which bursts elastically.

1. OXALIS. Linn. WOOD SORREL.

Gr. *oxus, sour;* from the acid taste of most species.

SEPALS 5, free or united at base. PETALS 5. STAMENS 10, usually more or less monodelphous, alternately shorter. CAPSULE deeply 5-lobed, 5-celled, each cell opening on the back. SEEDS few in each cell, pendulous from the axis.—

Herbs, with alternate or radical stipulate leaves, mostly of 3 inversely heart-shaped leaflets, which close and droop at nightfall.

* *Stemless; leaves and scapes from a root-stock or bulb.*

1. O. ACETOCELLA, L. *Common Wood Sorrel.*

Stalk creeping and scaly-toothed; *scape* 1-flowered, longer than the leaves; *leaflets* broad-obcordate, with rounded lobes; *petals* oval, obtuse; *styles* as long as the inner stamens.

Deep shady woods, on northern sides of mountains. June. *Scape* 3 to 5 inches high with 2 small bracts above the middle. *Flowers* large, white, with red veins, drooping. The whole plant has an agreeable acid taste. This is the *shamrock* of the Irish.

2. O. VIOLACEÆ, L. *Violet Wood Sorrel.*

Bulb scaly; *scapes* several-flowered in an umbel, longer than the leaves; *leaves* ternate; *leaflets* obcordate, smooth; *styles* shorter than the outer *stamens.*

Woods and shady places; common. May, June. *Scape* nearly twice as high as the leaves 4 to 6 inches. *Flowers* violet, large, from 3 to 9 on umbels, drooping. *Petals* obovate, and sometimes slightly emarginate.

** *Stems leafy: peduncles axillary.*

3. O. CORNICULATA, L. *Decumbent Wood Sorrel.*

Pubescent; *stem* rooting, decumbent, branched; *peduncles* 2-flowered, shorter than the leaves; *leaves* ternate; *leaflets* obcordate, pubescent; *petals* wedge-shaped, erose at the apex; *style* as long as the inner stamens.

Cultivated grounds and banks of streams. May—Aug. *Stems* prostrate, leafy, from 4 to 12 inches long. *Sepals* pubescent, ½ as long as the emarginate deep-yellow petals. *Capsules* densely pubescent.

4. O. STRICTA, L. *Upright Wood Sorrel.*

Stem branching, erect; *peduncles* umbelliferous, longer than the petioles, 2 to 6-flowered; *leaves* ternate; *leaflets* obcordate; *petals* obovate, entire; *styles* as long as the inner stamens.

Sandy fields and borders of woods. May—Aug. *Stem* 6 to 12 inches high, leafy, round, smooth, succulent. *Leaves* numerous, scattered on long stalks, *Flowers* small, pale-yellow.

ORDER 27. **BALSAMINACEÆ.**

Annual herbs, with succulent stems filled with a bland watery juice, very irregular flowers, and simple leaves without stipules. SEPALS 5, irregular, deciduous; the two upper commonly united into one, the lower spurred. PETALS 4, hypogynous, united in pairs, so that apparently there are only 2 petals. STAMENS 5; *filaments* subulate. OVARY 5-celled; *stigma* sessile, more or less, 5 lobed. FRUIT capsular, with 5 elastic valves and 5 cells. SEEDS solitary or numerous, without albumen.

1. IMPATIENS. Linn. BALSAM.

Name from the sudden bursting of the pod when touched.

SEPALS 5, the lower one spurred, the 2 upper united so as to appear like one. PETALS 2, unequal-sided and 2-lobed. STAMENS 5, short; *anthers* opening on the inner face. STIG-

MAS 5, united. CAPSULES prismatic-terete, elongated, 5-valved, the valves coiling elastically and projecting the seeds in bursting.—*Annual herbs with tender, smooth, suculent stems, tumid joints, and capsules burtsing elastically when touched.*

1. I. PALLIDA, Nutt. *Snap-weed. Touch-me-not.*

Leaves oblong-ovate, coarsely and obtusely serrate, *teeth* mucronate, on short petioles; *peduncles* 2 to 5-flowered, solitary, elongated: *lower sepal* dilated-conical, shorter than the petals, with a very short recurved spur.

Damp shady places: common. Aug. *Stem* 3 to 5 feet high, much branched. *Leaves* 2 to 5 inches long, 1¼ to 2 inches wide, with large obtuse teeth on petioles ½ inch long, upper ones sessile. *Flowers* large, mostly in pairs. Two outer sepals pale-green, hard-pointed, the rest pale-yellow. *Petals* pale-yellow, slightly spotted.

2. I. FULVA, Nutt. *Jewel-weed. Balsam-weed.*

Stem much branched; *leaves* rhombic-ovate, somewhat obtuse, coarsely and obtusely serrate; *teeth* mucronate *lower sepals* acutely conic, with a long round spur.

Damp shady ravines; common. Aug. *Stem* 2 to 4 feet high. *Leaves* 1 to 3 inches long, ½ as wide, somewhat glaucous, on petioles 1 to 2 inches long. *Flowers* deep orange with reddish-brown spots, smaller and less numerous than in the former species.

3. I. BALSAMINA, *Garden Balsamine. Ladies' Slipper.*

Leaves lanceolate, serrate, upper ones alternate; *peduncles* clustered; *spur* shorter than the flower. Native of the East Indies. A beautiful garden annual. The prevailing color of the flowers are red and white, but the former varies in every possible shade of crimson, scarlet, purple, pink and flesh-color, often double and semi-double.

ORDER 28. TROPÆOLACEÆ.

Straggling or twining herbs, with a pungent watery juice, peltate or palmate leaves, and irregular flowers. CALYX of 5 colored, united sepals, the lower one spurred. PETALS 5; two upper arising from the throat of the calyx remote from the 3 which are stalked. STAMENS 8, unequal, distinct. OVARY of 3 united carpels; *style* 1; *stigmas* 3. FRUIT separating 3 indehiscent, 1-seeded nuts. *Seeds* large. *Albumen* none.

1. TROPÆOLUM. Linn.

Lat. *tropæum*, a trophy; the leaf resembles a shield, the flower an empty helmet.

GENERIC CHARACTER essentially the same as the order.

T. MAJUS. *Nasturtion. Indian Cress.*

Leaves peltate, roundish repand on the margin, with the long petiole inserted a little one side of the centre; *petals* obtuse, the 2 upper distant from the 3 lower which are fimbriate at base and contracted into long claws. A common garden annual. Native of Peru. *Stem* at length climbing by means of its long petioles several feet. *Leaves* 2 inches in diameter. *Flowers* large and showy, orange-colored, with blotches of a deeper shade. The fruit is used for pickling.

ORDER 29. **LIMNANTHACEÆ.**

Low annual herbs, with pinnated alternate leaves without stipules. FLOWERS regular, trimerous or pentamerous. SEPALS 3 to 5 united at base persistent, valvate in æstivation. PETALS 3 to 5, withering on the plant, inserted upon an hypoygnous disk. STAMENS 6 to 10, inserted with the petals; *filaments* opposite the sepals. STYLES united; *stigma* simple: *ovary* of 2 to 5 distinct carpels. FRUIT 2 to 5 achenia, rathor fleshy. *Seeds* solitary.

1. FLŒRKIA. Willd.

Named in honor of *Flœrke,* a German botanist.

SEPALS 3, longer than the 3 petals. STAMENS 6. OVARIES 3, tuberculate. STYLE 2-cleft.—*A small annual aquatic, with pinnately divided leaves and minute solitary flowers on axillary peduncles.*

F. PROSERPINACOIDES, Lindl. *False Mermaid.*

Stems decumbent, weak, and slender; *leaves* alternate, *upper ones,* or those above the water, pinnately 5-parted; *lower* or submersed ones mostly 3-parted, all on slender petioles.

Marshes and shores of rivers and lakes. April, May. *Stem* 4 to 10 inches long. *Flowers* small, ¼ inch in diameter, white. *Petals* about half as long as the sepals. Whole plant slightly pungent to the taste.

ORDER 30. **ZANTHOXYLACEÆ.**

Trees or shrubs, pungent and aromatic bitter, with alternate or opposite leaves, without stipules, with pellucid dots and small regular diœcious or polygamous flowers. FLOWERS regular diclinous, gray, green, or pink. SEPALS 3 to 5, small, cohering at the base. PETALS longer than the sepals, as many, rarely wanting, convolute. STAMENS as many or twice as many as the petals. PISTILS 2 to 5, distinct or united, 1 to 2 seeded, (ovules 2, collateral). FRUIT baccate, membraneous or drupaceous, or 2-valved capsules. SEEDS solitary or in pairs.

1. ZANTHOXYLUM. Linn. PRICKLY ASH.

Gr. *xanthos,* yellow, and *xulon,* wood.

FLOWERS diœcious. SEPALS 5, petal-like when the petals are absent. STAMENS 5. PISTILS 3 to 5, raised on a short base or stalk, distinct, the styles connivent. CARPELS thickish, 2-valved. SEEDS black and shining.—*Fragrant aromatic shrubs, with pellucid punctate, pinnately 3 to 5 foliate leaves, and greenish-yellow flowers.*

13. AMERICANUM, Mill. *Prickly Ash.*

Stem and branches prickly; *leaves* pinnate; *leaflets* in 4 to 5 pairs and an odd one, ovate-oblong, downy when young; *petioles* round, unarmed; *prickles* stipular; *flowers* in short axillary sessile umbels.

Rocky woods; not common. April. *Shrub*, 4 to 10 feet high, covered with sharp strong prickles. *Leaves* and flowers axillary. *Flowers* small greenish appearing before the leaves. *Bark* and pods very pungent to the taste, Medicinal.

2. PTELEA. Linn. SHRUBBY TREFOIL.

FLOWERS polygama-diœcious. SEPALS 3 to 5, small. PETALS 3 to 5, much longer than the sepals. STAMENS 3 to 5, longer than the petals, and alternate with them. OVARY 2-celled; *style* short; *stigmas* 2. FRUIT a 2-celled samara, winged all round, nearly orbicular. *Shrubs, with* 3 *to* 5-*foliate leaves and greenish-white small flowers in compound terminal cymes.*

P. TRIFOLIATA, L. *Shrubby Trefoil.*

Leaves on long petioles, ternate; *leaflets* ovate, pointed, downy when young, odd one much attenuated at base; *flowers* polygamous, mostly with 4 stamens.

Moist woods and rocky places; rare. June. An ornamental shrub 6 to 8 feet high. *Flowers* white, odorous, nearly ½ inch in diameter. *Samera* nearly 1 inch in diameter.

The AILANTHUS GLANDULOSUS, or Tree of Heaven, is a cultivated tree of this family, common in and around our villages, whose flowers are redolent of anything but "airs from heaven."

ORDER 31. ANACARDIACEÆ.

Trees or shrubs, with a resinous gummy, caustic or milky juice, dotless, alternate, simple, ternate or pinnate leaves, and small often polygamous, regular pentandrous flowers. FLOWERS terminal or axillary, with bracts, commonly diœcious. SEPALS 3 to 5, united at base, persistent. PETALS 3 to 5, sometimes none, imbricate. OVARY 1-celled, 1-ovuled. STYLES 3, or none. STIGMAS 3. FRUIT indehiscent, usually drupaceous. SEEDS without albumen.

1. RHUS. Linn. SUMACH.

CALXY of 5 sepals, united at base. PETALS 5. STAMENS 5, equal, inserted on the disk. STYLES 3. short. STIGMAS capitate. FRUIT a small-seeded sub-globose, dry drupe.—*Small trees or shrubs, sometimes climbing by rooting tendrils, alternate, mostly compound leaves, and greenish-white flowers.*

* *Not poisonous; fruit clothed with (acid) crimson hairs: panicle compound, dense, terminal; leaves odd pinnate.*

1. R. GLABRA, L. *Smooth Sumach.*

Stem and *branches* smooth; *leaflets* 6 to 15 pairs, sessile, lanceolate, acuminate, smooth, whitish glaucous beneath; *flowers* all perfect.

Old fields and thickets; common. July. *Shrub* 6 to 15 feet high, consisting of many straggling branches, smooth except its point. *Leaflets* about 3 inches long, ¾ inches wide. *Flowers* greenish-yellow. *Fruit* crimson, covered with short hairs, acid, used for dyeing red. The bark is used for tanning morocco.

2. R. COPALLINA, L. *Dwarf Sumach.*

Branches and stalks downy; *leaflets* 4 to 7-pairs, oval-lanceolate, or oblong, very entire, shining on the upper surface, pubescent beneath, unequal at base; *common petiole* winged, appearing as if jointed.

Rocky hills and dry fields. July, August. *Shrub* 2 to 7 feet high with running roots. *Common petiole* about 6 inches long expanding into a leafy margin, between each pair of leaflets. *Leaflets* 1 to 3 inches long, near ⅓ as wide, dark green and glossy on the upper surface. *Flowers* diœcious, yellowish-green. *Fruit* red, small, compressed, hairy, acid, and bitter.

3. R. TYPHINA, L. *Stag-horn Sumach.*

Branches and *petioles* densely villous; *leaflets* 6 to 15 pairs, oblong-lanceolate, acuminate, acutely serrate, whitish beneath.

Hillsides or low barren places. June. A large shrub, or a spreading tree, 15 to 30 feet high with orange-colored aromatic wood and copious milky resinous juice. *Flowers* greenish-yellow, diœcious. *Fruit* in clusters, covered with a velvety purple down, acrid.

* * *Poisonous to the touch: fruit smooth: panicles axillary.*

4. R. VENENATA, DC. *Poison Sumach.*

Smooth; *leaves* odd-pinnate, 3 to 6 pairs, oval abruptly acuminate, very entire, *panicles* loose, pedunculate.

Margins of swamps. June, July. A shrub or small tree of fine appearance, 10 to 15 feet high. *Petioles* 6 to 10 inches long, red. *Leaflets* about 3 inches long, nearly ½ as wide, sessile, except the odd one. *Flowers* very small, greenish, diœcious. *Fruit* about as large as a pea. The whole plant is very poisonous, tainting the air to some distance around with its pernicious effluvium.

5. R. TOXICODENDRON. L. *Poison Oak.*

Erect or decumbent; *leaves* ternate; *leaflets* broad-oval or rhomboid, entire, sinuate or lobed, somewhat pubescent; *flowers* in racemose axillary sub-sessile panicles.

Moist woods and thickets. June. A small shrub, 1 to 3 feet high, nearly smooth in all its parts. *Leaflets* 2 to 6 inches long ⅔ as wide, petiolate, the common petiole 4 to 5 inches long. *Flowers* small, diœcious, greenish-yellow. *Fruit* smooth, roundish, pale-brown. Poisonous.

Var. *b.* RADICANS. Torr. (R. radicans. Linn, DeCandolle and Beck.) *Poison Ivy.*

Stem climbing; *leaves* ternate; *leaflets* petiolate, ovate, acuminate, smooth, generally entire; *flowers* in axillary racemes towards the top of the stem, diœcious.

Woods and hedges. June. *Stem* climbing by myriads of rooting tendrils 10, 20 or 50 feet. *Flowers* yellowish-green. *Fruit* sub-globose, brown.

* * * *Leaves ternate; flowers diœcious, not poisonous, aromatic.*

6. R. AROMATICA, Ait. *Fragrant Sumach.*

Branches slender, nearly smooth; *leaves* ternate; *leaflets* rhombic-ovate, sessile, the middle one wedge-shaped at the base, unequally cut-toothed, pubescent when young.

Dry rocky soil; rare. April, May. A small aromatic shrub 2 to 6 feet high. *Leaflets* 1 to 2 inches long, ½ as wide, the common petioles 1 to 2 inches long. *Flowers* yellowish, in clustered scaly-bracted spikes like *catkins*, preceding the leaves. *Fruit* red, acrid, more or less hisped.

7. R. COTINUS. *Venitian Sumach.*

A small shrub, cultivated: native of Arkansas, according to *Nuttall*, remarkable chiefly for the singular and ornamental appearance of its long, diffuse feathery fruit-stalks, showing in the distance as if the plant were enveloped in a cloud of smoke.

ORDER 32. ACERACEÆ.

Trees with opposite palmately lobed, rarely pinnate leaves, without stipules, and flowers often polygamous, sometimes apetalous, small, in axillary racemes, corymbs or fascicles. SEPALS 5, rarely 4 to 9, more or less united, colored, imbricate in æstivation. PETALS 5, rarely 4 to 9, alternate with the sepals, hypogynous. STAMENS usually 8, sometimes 9 to 12, distinct. STYLES 2. STIGMAS 2. OVARY 2-lobed, 2-celled. FRUIT of 2 indehiscent winged samara, each 1-celled, 1 to 2-seeded. SEEDS with little or no albumen.

1. ACER. Linn. MAPLE.

Lat. *acer*, sharp; the wood was anciently manufactured into weapons of war.

CALYX 5-lobed, sometimes 5-parted. PETALS 5, or more. STAMENS 6 to 8, rarely 5. SAMARA 2-winged, united at base by abortion, 1-seeded.—*Trees with simple, palmately lobed leaves, often heart-shaped at the base, and mostly polygamous flowers.*

* *Flowers in corymb or fascicles. Trees.*

1. A. RUBRUM, L. *Red Maple. Swamp Maple.*

Leaves 3 to 5 lobed, heart-shaped at the base, irregularly serrate and notched, acute, the middle one usually the longest, glaucous, underneath; *flowers* on very short pedicels; *petals* linear oblong.

Moist woods. March, April. A common tree from 20 to 40 feet high, with reddish twigs. *Trunk* covered with a smooth bark, marked with large, white spots, becoming dark with age. *Leaves* variable in size, pubescent when young. *Flowers* appearing in early spring before the leaves, scarlet, or yellowish, about 3 in each fascicle. *Fruit* on pedicels 2 to 3 inches long, smooth.

2. A. DASYCARPUM, Ehrh. *White Maple. Silver Maple.*

Leaves deeply 5-lobed, with the sinuses rather acute, unequally and incisely toothed; whitish glaucous underneath; *flowers* aggregated on short petioles; *petals* none; *fruit* woolly when young, nearly smooth when grown, with large dilated wings.

Banks of streams; not common. April, May. A fine ornamental tree, 30 to 50 feet high, affording a sweet sap. *Leaves* on long petioles, nearly smooth when old. *Flowers* greenish-yellow or purplish, usually about 5 together. *Pedicels* of the fruit about an inch long.

3. A. SACCHARINUM, L. *Sugar Maple. Rock Maple.*

Leaves 3 to 5 lobed, with rounded sinuses and pointed lobes, sparingly sinuate toothed, subcordate at base, glaucous beneath; *flowers* from terminal leaf bearing and lateral leafless buds, drooping; *pedicels* slender, hairy; *calyx* hairy at the apex; *petals* none.

Woods and mountain valleys. April. A fine tree 50 to 80 feet high, with a trunk 2 to 3 feet in diameter. *Bark* of a light-gray color, rough and scaly. *Branches* numerous and finely ramified in open situations. *Foliage* very luxurient, deep green and smooth above. *Flowers* yellowish, on long thread-like peduncles. *Petioles* smooth. This is one of the most useful trees of the forest; the sugar obtained frow its sap is perhaps the most delicious of all sweets. The wood is very strong and compact, often presenting that beautiful arrangement of fibre, called *bird's-eye maple*, which is so highly esteemed in cabinet work. It is extensively cultivated as an ornamental shade tree.

** *Flowers in terminal racemes. Large shrubs.*

4. A. PENNSYLVANICUM, L. *Striped Maple.*

Leaves with 3 acuminate lobes, rounded at base, finely and sharply double serrate; *racemes* drooping, loose; *petals* obovate; *fruit* with large diverging wings.

Rich woods and shady rocks. May. A shrub or small tree 10 to 15 feet high. *Trunk* beautifully striped lengthwise with green and black. *Leaves* rarely undivided. *Flowers* large, yellowish-green, 10 to 12 in a raceme. *Fruit* clustered, with pale-green wings.

5. A. SPICATUM, Lam. *Mountain Maple.*

Leaves small, 3 to 5 lobed, acute, dentate, pubescent beneath; *racemes* erect, dense, somewhat compound; *petals* linear; *fruit* smooth; *wings* somewhat diverging.

Rocky hills and mountains. May, June. A *shrub* 8 to 12 feet high growing in clumps. The bark is of a light gray color. *Leaves* somewhat pointed, with large sharp teeth, more or less cordate at base. *Flowers* greenish, numerous and small, in round, oblong, close-branched clusters 2 to 3 inches long, becoming pendulous with the winged fruit.

2. NEGUNDA. *Mœnch.*

CALYX minute, 5-cleft. PETALS none. STAMENS mostly 5.—*Small trees with compound pinnately* 3 *to* 5-*foliate leaves, and diœcious flowers, from lateral buds; the sterile in clusters on capillary pedicels; the fertile in drooping racemes.*

N. ACEROIDES, Mœnch. *Ash-leaved Maple. Box Elder.*

Leaves ternate, or pinnate by fives; *leaflets* ovate, acuminate, remotely and unequally dentate; *pistillate racemes* long and pendulous; *barren flowers* corymbose; *fruit* oblong, with large wings dilated upwards.

River banks, low wet grounds and along mountain streams. April. A small but handsome tree 10 to 20 feet high, with light-green twigs, and smooth yellowish-green bark. *Flowers* yellowish-green, very delicate, in drooping clusters, rather preceding the leaves. *Fruit* pubescent, oblong, the wings about an inch long.

ORDER 33. **SAPINDACEÆ.**

Trees, shrubs, or climbers furnished with tendrils, rarely herbs, with alternate and mostly compound leaves, and small, unsymmetrical, usually irregular and polygamous flowers. CALYX of 4 or 5 sepals. PETALS irregular and often one fewer than the sepals, sometimes wanting. STAMENS 8 to 10. OVARY 2 to 3-celled, the *styles* or *stigmas* more or less united. SEEDS usually with an aril, destitute of albumen.

1. CARDIOSPERMUM. Linn.

Gr. *kardia*, heart, *sperma*, seed; the globose seeds marked with a large *cordate* hilum.

SEPALS 4, the 2 outer smallest. PETALS 4, each with an emarginate scale above the base, the 2 lower remote from the stamens, their scales crested; *glands* of the disk 2, opposite the lower petals. STAMENS 8, unequal. STYLE trifid. CAPSULE membraneous.—*Climbing herbs, with biternate* *leaves, the lower pedicels changed to tendrils, and small whitish flowers.*

C. HALIACABUM, L. *Heart-seed. Balloon-vine.*

Plant nearly smooth; *leaflets* ovate-lanceolate, incisely lobed and dentate; *flowers* small, axillary, solitary; *fruit* pyriform-globose, large, bladder-like. *Native* along the Missouri river. Torr. & Gr. July. A curious vine 4 to 6 feet long, with remarkably large inflated membraneous capsules.

SUB-ORDER. HIPPOCASTANACEÆ.

Trees or shrubs, with opposite digitate leaves, without stipules. FRUIT roundish, coriaceous, dehiscent, with 1 to 3 very large seeds, resembling chestnuts. EMBRYO very large and fleshy, showing a 2-leaved plumule. COTYLEDONS united.

2. ÆSCULES. Linn. HORSE-CHESTNUT.

CALYX regular, 5-lobed, companulate. PETALS 4, sometimes 5, more or less unequal, with claws. STAMENS 7 (rarely 6 or 8); *filaments* long and slender, often unequal. STYLE 1, filiform, acute; *ovary* 3-celled, with 2 ovules in each, only one of which, or one in each cell, ripens into a seed.—*Trees and shrubs with 5 to 7-foliate leaves, and flowers in thyrse-like panicles.*

1. Æ. GLABRA, Willd. *Ohio Buckeye.*

Leaflets 5, oval or oblong, acuminate, serrate or serrulate, very smooth; *corolla* 4-petalled, spreading, with the claws as long as the calyx; *stamens* longer than the corolla; *fruit* echinate.

Banks of streams: Western part of the State. May. A small ill-scented tree. *Leaflets* 3 to 6 inches long, 1 to 2 inches wide, sub-sessile, or abruptly contracted at base to a short stalk. *Flowers* yellowish-white, small, slightly irregular, in terminal racemose panicles. *Fruit* about ¾ inch in diameter, prickly.

2. Æ. PAVIA, L. *Small Buckeye.*

Leaflets 5, oblong-lanceolate, cuneate at base, abruptly and shortly acuminate, finely serrate; *flowers* very irregular in a loose thyrsoid raceme; *petals* 4, erect, as long as the stamens.

A beautiful shrub, 6 to 10 feet high, cultivated for ornament: native of the Southern States; probably indigenous in the South-western part of our State. April, May. *Flowers* large, red, smooth.

3. Æ. HIPPOCASTANUM, L. *Common Horse-chestnut.*

Leaves digitate, of 7 obovate-cuneate leaflets, crenate, dentate; *petals* 5, spreading; *stamens* 7 declined, fruit prickly. This well known introduced tree is nearly naturalized. Native of Asia. In June it puts forth numerous pyramidal racemes or thyrses of pink and white flowers, finely contrasting with the dark-green of its massy foliage.

ORDER 34. **CELASTRACEÆ.**

Shrubs or small trees, with opposite or alternate leaves, small, regular and symmetrical flowers. SEPALS 4 to 5, united at base, imbricated. PETALS 4 to 5, inserted by a broad base under the margin of a flat expanded disk which surrounds the ovary. STAMENS 4 to 5, alternate with the petals, inserted on the margin of the disk. OVARY superior, immersed in, and adhering to the disk. FRUIT a capsule or berry. SEEDS solitary or few.

TRIBE 1. STAPHYLEÆ.

Leaves pinnate, opposite. Seeds long, not ariled. Ovary many-ovuled, free from the cup-shaped disk.

1. STAPHYLEA. Linn. BLADDER-NUT.

Gr. *staphule*, a *cluster;* in allusion to its mode of flowering.

SEPALS 5, oblong, erect, colored, persistent. PETALS 5, with short claws. STAMENS 5. PISTILS 3, united in the axis, their long styles cohering, but separating as the ovary enlarges into the membranaceous inflated 3-lobed, 3-celled capsules.—*Upright shrubs, with opposite pinnate leaves and white flowers in raceme-like clusters, terminating the branchlets.*

1. S. TRIFOLIA, L. *Bladder-nut.*

Leaves ternate, on long petioles; *leaflets* ovate, acuminate, serrulate, pubescent, the terminal one petioled; *styles* smooth.

Moist thickets and rocky places. May. A handsome shrub 6 to 10 feet high, with straight and smooth slender branches. *Flowers* white, with spots of orange, in pendulous clusters.

TRIBE 2. EUONYMEÆ.

Leaves simple; style 1: stigmas 3-lobed: ovaries 2 in each cell; seeds with pulpy arils; disk adhering to the bottom of the calyx.

2. CELASTRUS. Linn. SHRUBBY BITTER-SWEET.

FLOWERS sometimes polygamous. SEPALS 5, united at base. PETALS 5 sessile. STAMENS on the margin of a cup-shaped disk. PISTILS on the disk. CAPSULE globose, or 3-angled, 3-celled. SEEDS 1 to 2 in each cell, erect, enclosed by a pulpy scarlet aril.—*Climbing or twining shrubs, with alternate leaves, minute deciduous stipules and small greenish flowers in raceme-like clusters terminating the branches.*

C. SCANDENS, L. *Climbing Bitter-sweet. Wax-work.*

Stem climbing and twining, unarmed; *leaves* oblong, acuminate, serrate, petioled, *stipules* minute; *racemes* terminal: *flowers* diœcious.

Woods and thickets. May, June. A handsome climbing shrub, the stems twining about trees and each other, ascending to a great height. *Leaves* smooth. *Flowers* in small racemes, greenish-white. *Seeds* covered with a scarlet aril, contained in an orange-colored 3-valved capsule.

3. EUONYMUS. Tourn. SPINDLE-TREE.

SEPALS 4 or 5, united at the base, forming a short and flat calyx. PETALS 4 to 5, rounded, spreading. STAMENS very short, inserted on the upper face of a broad and flat 4 to 5-angled disk. STYLE short or none. CAPSULE with 3 to 5 angles, 3 to 5 cells and as many valves. SEEDS 1 to 2 in each cell, inclosed in a red fleshy aril.—*Shrubs with 5-sided branchlets, opposite serrate leaves, and loose cymes of small green or dark purple flowers on axillary peduncles.*

1. E. ATROPURPUREUS, Jacq. *Burning Bush.*

Stem with smooth, opposite; square branches; *leaves* petioled, oval-oblong, pointed, serrate, pubescent beneath; *flowers* mostly in fours; *fruit* smooth, deeply lobed.

Hedges and banks of streams; sometimes cultivated. June. A handsome ornamental shrub 4 to 8 feet high. *Flowers* dark purple. *Fruit* very showy at the close of autumn, drooping on long peduncles. *Capsule* crimson, smooth. *Aril* enclosing the seed, scarlet.

2. E. AMERICANUS, L. *Strawberry Tree. Burning Bush.*

Branches opposite, smooth, square; *leaves* opposite, sessile, oblong-lanceolate, varying to oval, acute, serrate; *peduncles* 1 to 3-flowered, rounded; *calyx* small, with acute segments; *flowers* in fives, *fruit* rough, warty, depressed.

Wet places and moist woods. June. *Shrub* 4 to 6 feet high. *Flowers* greenish-yellow with a tinge of purple. *Fruit* not as copious as the above, crimson when ripe, the aril scarlet.

ORDER 35. **RHAMNACEÆ.**—*The Buckthorn Family.*

Shrubs or small trees, with simple leaves, minute stipules, and small regular axillary or terminal flowers (sometimes apetalous). Branches often thorny. SEPALS 4 or 5, united at base, valvate in æstivation. PETALS 4 or 5, distinct, cucullate or concave, inserted along with the stamens into the edge of a fleshy disk which lines the short tube of the calyx. STAMENS 4 to 5 opposite the petals. OVARY superior or half superior, 2 to 5-celled. STIGMAS 2 to 5. FRUIT fleshy and indehiscent, or dry and separating in 3 parts. SEEDS erect, mostly with fleshy albumen.

1. RHAMNUS. Linn. BUCKTHORN.

Gr. *Ramnos,* the ancient name; from the numerous branchlets.

CALYX 4 to 5-cleft. PETALS 4 to 5, shorter than the sepals, alternate with the lobes of the calyx, sometimes very minute or wanting. STAMENS 4 to 5, inserted above the petals. STYLE 2 to 4-cleft. FRUIT a berry-like drupe, containing 2 to 4 cartilaginous nuts.—*Small trees or shrubs, with mostly alternate leaves, and minute flowers in short axillary clusters, often polygamous or diœcious.*

1. R. alnifolius, L'Herit. *Alder-leaved Buckthorn.*

Shrub erect with unarmed branches; *leaves* alternate, ovate, acuminate, serrate, pubescent on the veins beneath; *peduncles* aggregate, 1-flowered; *flowers* mostly pentandrous; *calyx* acute, *styles* 3, united, very short; *fruit* top-shaped.

Sphagnous swamps. May, June. A spreading shrub 2 to 4 feet high. *Leaves* 1 to 3 inches long, ½ as wide, acute at base. *Flowers* small, greenish, mostly apetalous. *Berries* about as large as small peas, black.

2. R. lanceolatus, Pursh. *Lance-leaved Buckthorn.*

Leaves oblong-lanceolate, acuminate; (floral ones obtuse, mostly ovate or roundish), closely serrulate, minutely downy underneath; *petals* 4, deeply obcordate, about as long as the short stamens; *seeds* 2.

Hills and river banks: Mercersburg, Franklin Co. *Prof. Traill Green.* May. A tall shrub, not thorny. *Later leaves* long, often oblong-ovate. *Flowers* yellowish-green, diœcious-polygamous; the *pedicels* usually single in the more fertile plant, which has the 2-cleft style exserted, and produces abundant globular drupes about the size of a pepper-corn. The less fertile plant bears rather larger flowers, on clustered pedicels, with a very short and included style. *Drupes* large top-shaped, distinctly pointed with the short style. *Seeds* obovate, deeply grooved.

Order 36. **VITACEÆ.**—*The Vine Family.*

Shrubs, climbing by tendrils, with simple or compound leaves, and small, regular, often polygamous or diœcious flowers with a minute truncate nearly entire calyx. Petals 4 to 5, very deciduous, inserted on the outside of the disk. Stamens 4 to 5 opposite the petals, inserted on the disk, sometimes sterile, by abortion. Pistils with a short style, or none, and a slightly 2-lobed stigma. Ovary 2-celled, with 2 erect anatropous ovules from the base of each. Fruit a globose pulpy berry, with hard albumen.

1. VITIS. Linn. Vine.

Calyx somewhat 4 to 5-toothed. Petals 4 to 5, cohering at their apex, usually falling off without expanding. Stamens 5. Style none. Base of the ovary surrounded with a 4 or 5-lobed ring, or 4 to 5 glands alternate with the stamens. Berry 2-celled, 1 to 4-seeded; cells and seeds often abortive.—*Flowers fragrant in a compound thyrse. Peduncles often changed into tendrils.*

1. V. Labrusca, L. *Northern Fox Grape.*

Leaves very large, broad-cordate, angular-lobed, acutely toothed, smooth above, very woolly beneath, *racemes* small, panicled; *berries* large.

Moist thickets and woods; common. June. *Stem* climbing to a great height. *Leaves* and young branches very woolly. *Flowers* small, green. *Fruit* large, purple, often green or red, ripe in Sept. The *Isabella, Catawba, Blands* and other sorts known in cultivation, are varieties of this species.

2. V. æstivalis, Michx. *Frost Grape. Winter Grape.*

Young leaves downy with loose ferruginous hairs beneath, smoothish when old, green above, broadly cordate, 3 to 5-lobed or palmate-sinuate, coarsely dentate; *fertile raceme* long, panicled, opposite the leaves; *berries* small.

Hills, woods and river banks. June. *Stem* very long, slender, climbing. *Leaves* very large, clothed beneath when young with cobweb-like, rust-colored pubescence. *Tendrils* from the peduncles, with an opposite leaf. *Berries* deep blue, with a bloom well flavored, but small, ripe in Sept.

3. V. CORDIFOLIA, Michx. *Frost Grape. Winter Grape.*

Leaves cordate, acuminate, somewhat equally but coarsely toothed, smooth on both sides; *raceme* loose, many-flowered; *berries* small.

Thickets by river banks; common. June. *Stem* ascending, shrubs and trees to the height of 10 to 20 feet. *Leaves* large, membranous, often 3-lobed, with pubescent veins when young, and a few mucronate teeth. *Berries* nearly black, small, late, acid, but well flavored after being frosted.

4. V. VINIFERA. *Common Wine Grape.*

Leaves cordate, sinuately 5-lobed, smooth; *flowers* all perfect. Naturalized in nearly all temperate climates. Varieties without end may be raised from the seed, which will bear fruit the 4th or 5th year.

2. AMPELOPSIS. Michx.

Gr. *ampelos*, the *vine*, and *opsis*, appearance; resembling the vine.

CALYX slightly 5-stalked. PETALS concave, spreading deciduous after expansion. STIGMAS capitate. OVARY without a 5-lobed ring, 2 to 4-seeded.—*Fine shrubby creepers with digittate or cordate leaves and cymose clusters of flowers: supported by radiating tendrils.*

1. A. QUINQUEFOLIA, Michx. *Virginian Creeper.*

Leaves quinate, digitate; *leaflets* oblong, acuminate, petiolate, dentate, smooth, racemes somewhat dichotomously cymose.

Woods and thickets. June, July. A vigorous climber, cultivated as a covering for walls, trellises, &c. *Flowers* inconspicuous, greenish, in forked clusters. *Berries* dark blue, smaller than peas.

2. E. CORDATA, Michx. *Heart-leaved Creeper.*

Stem climbing, with slender branches; *leaves* cordate, acuminate, toothed and angular; *nerves* beneath, pubescent; *racemes* dichtomous, few-flowered.

Banks of streams. June, July. *Panicles* opposite the leaves. *Berries* pale-red. *Beck.*

ORDER 37. POLYGALACEÆ.

Plants, shrubby or herbaceous, with simple, entire, alternate or rarely opposite, leaves destitute of stipules, and irregular papilionaceous flowers, with 4 to 8 diadelphous stamens. SEPALS 5, very irregular, distinct, 3 exterior, of which 1 is superior and 2 inferior, 2 inner ones called the *wings* much larger, and colored like the petals. PETALS 3, hypogynous the anterior (*keel*) larger than the rest, and usually crested. STAMENS 6 or 8, with their *filaments* combined in a tube which is split on the upper side, cohering more or less with the petals, free above. ANTHERS 1-celled, opening by a terminal pore. OVARY superior, 2-celled. STYLE and *stigma* simple. FRUIT usually a capsule generally rounded or notched at the apex. SEEDS with an abundant albumen.

1. POLYGALA. Tourn. MILKWORT.

Gr. *polus*, much, and *gala*, milky; supposed to favor the lacteal secretions.

SEPALS 5 persistent, 2 of them wing-shaped and colored. PETALS 3 to 5, united to the stamens, the lower one keel-form. CAPSULE obcordate, 2-celled, 2-valved, 2-seeded. *Seeds* smooth with a caruncle.—*Low bitter herbs, with simple entire leaves, often dotted, and no stipules, sometimes bearing concealed fertile flowers also next the ground.*

* *Annual: flowers purple to white; spikes ovate globose or oblong, dense.*

1. P. INCARNATA, L. *Flesh-colored Milkwort.*

Stem erect, slender, simple or sparingly branched; *leaves* small, linear-subulate, few; *spikes* oblong or cylindrical, without glands; *corolla* with a long tube.

Dry soils. June, July. *Stem* 1 to 2 feet high. *Leaves* ½ inch long, remote. *Spikes* 1 to 1½ inches long. *Flowers* pale rose-color or flesh-color; *wings*, much shorter than the conspicuously crested corolla; *claws* of the petals united into a very long and slender-cleft tube.

2. P. PURPUREA, Nutt. *Purple Milkwort.*

Stem branching at top; *leaves* linear, alternate; *flowers* beardless, imbricated in obtuse, cylindrical spikes; *wings* of the calyx cordate-ovate, erect, twice as long as the capsule.

Meadows and wet grounds. July—Sept. A handsome erect plant 6 to 10 inches high, easily recognized by its short purplish, cylindrical spike of flowers. *Stem* angular with fastigiate branches, each ending with a spike smaller than the main stem, but rising above it in height.

* * *Spikes elongated or racemose; flowers white or greenish.*

3. P. AMBIGUA, Nutt. *Ambiguous Milkwort.*

Stem erect, very slender, loosely branched; *lowest stem leaves* in whorls of four, the rest scattered, narrowly linear; *spikes* long peduncled, very slender; *flowers* crested; *bracts* deciduous.

Dry woods. Aug., Sept. *Stem* 6 to 12 inches high, somewhat angular. *Leaves* sessile, tapering to the base, ½ to 1 inch long, narrow. *Racemes* spicate, acute, about 1 inch long, 20 to 30-flowered, on peduncles 1 to 3 inches long. *Flowers* small, greenish-white, tinged with purple. *Wings* of the calyx round and veined.

4. P. VERTICELLATA, L. *Whorl-leaved Milkwort.*

Stem erect, branched; *leaves* whorled, linear and lance-linear; raceme spiked, dense, acute, on rather short peduncles; *bracts* falling with the flowers; *wings* round, clawed.

Dry hills; common. July—Oct. *Stem* very slender, square, 6 to 10 inches high. *Leaves* in whorls of 4 or 5, ½ to 1 inch long, alternate on the branches. *Flowers* small, greenish-white, sometimes tinged with purple; *crest* rather large in proportion.

5. P. SENEGA, L. *Seneca Snake-root.*

Stems several form a thick and hard knotty root, simple; *leaves* alternate, lanceolate, tapering at each end, rough on the margin, *spikes* cylindrical, rather dense, somewhat acute; *flowers* on extremely short pedicels; *wings* of the calyx orbicular; *capsule* elliptic, emarginate.

Woods and meadows. June, July. Perennial. *Stem* a foot high, with ovate scale-like leaves at the base. *Leaves* smooth, finely serrulate, 1 to 3 inches long, ⅓ as wide, numerous, scattered. *Flowers* white in a filiform spike 1 to 3 inches long.

Sepals obtuse, larger than the petals. *Root* medicinal. A valuable stimulating expectorant.

* * * *Perennials: flowers purple, showy, larger than the former; bearing whitish fertile ones on subterranean branches.*

6. P. POLYGAMA, Walt. *Bitter Milkwort.*

Stems numerous, simple, erect and procumbent; *leaves* linear-lanceolate, or obovate, alternate, attenuate downwards; *racemes* filiform, terminal and lateral, elongated; *flowers* sessile, the broadly obovate wings longer than the crested corolla.

Fields and pastures. June, July. *Stems* crowded, many from the same root, angular, smooth. *Leaves* smooth, lower obovate, upper linear-lanceolate, obtuse, sessile. *Flowers* purple, ¼ inch in diameter, very handsome, 8-androus. *Subteranean flowers* on procumbent racemes, without petals, sessile. Bitter and tonic.

7. PAUCIFOLIA, Willd. *Fringed Polygala.*

Stem simple, erect, naked below, rising from long and slender prostrate or subteranean shoots, which bear concealed fertile flowers; *leaves* ovate, acute, smooth; *terminal flowers* mostly in threes, large cristate, sometimes axillary; *wings* obovate, rather shorter than the conspicuously fringe-crested keel.

Woods along mountains in light soil. May. A delicate plant with large showy purple flowers, ¾ inch long. *Stem* 3 to 4 inches high. *Lower leaves* small and scattered, scale-like. The radical flowers are either close to the ground or subteranean, smaller, greenish.

ORDER 38. **LEGUMINOSÆ.**—*Leguminous Plants.*

Herbaceous plants, shrubs or trees, with alternate mostly compound leaves with stipules, and papilionaceous flowers, 10-monodelphous, diadelphous, or rarely distinct stamens, and a single, simple pistil, producing a legume in fruit. CALYX of 5 sepals more or less united. PETALS 5, *papilionaceous* or rarely regularly spreading. STAMENS definite or indefinite, inserted with the corolla. OVARY simple, superior. FRUIT a legume. SEEDS attached to the upper suture, without albumen.

SUB-ORDER I. PAPILIONACEÆ.

PETALS truly papilionaceous, imbricate in æstivation, the upper one extended. STAMENS 10, mostly diadelphous, 9 united by their filaments into a sheath split on the upper side when the 10th is free.

TRIBE 1. VICIEÆ. *The Vetch or Pea Tribe.*

Herbs with abruptly pinnate leaves, the common petiole produced into a tendril or bristle; peduncles axillary.

1. VICIA. Tour. VETCH.

CALYX tubular, 5-cleft or 5-toothed, the 2 upper teeth often shorter. STAMENS diadelphous. STYLE filiform, bent at a right angle with the ovary, hairy down the entire side. LEGUME oblong, many-seeded.—*Herbaceous mostly climbing plants, with abruptly pinnate leaves of several pairs of leaflets, and a branching tendril. Peduncles axillary.*

1. V. CAROLINIANA, Walt. *Carolina Vetch.*

Nearly smooth; *leaflets* 8 to 10, elliptical-lanceolate, obtuse, scarcely mucronate; *peduncles* loosely flowered, as long or longer than the leaves; *flowers* distant; *calyx* teeth very short.

Borders of woods and along fences. May, June. Per. *Stem* 2 to 4 feet long, climbing. *Leaflets* ¾ inch long, ⅛ to ¼ wide. *Flowers* small, white or pale-blue. *Standard* black at the tip. *Legume* oblong.

2. V. AMERICANA, Muhl. *American Vetch.*

Smooth; *leaflets* 10 to 14, elliptical or ovate-oblong, very obtuse, many-veined; *stipules* semi-sagittate, deeply-toothed; *peduncles* 4 to 8-flowered, shorter than the leaves.

Moist thickets and woods. June. Per. *Stem* 1 to 3 feet long, slender, somewhat 4-angled. *Leaflets* 1 inch long, nearly ½ as wide. *Flowers* purplish-blue, ¾ inch long. *Style* very hairy at the summit. *Legumes* oblong-linear, compressed, reticulated.

3. V. CRACCA, L. *Tufted Vetch.*

Downy-pubescent; *stem* branching; *leaflets* 10 to 20, oblong-lanceolate, strongly mucronate; *stipules* semi-sagittate, linear, nearly entire; *peduncles* densely many-flowered; *calyx* teeth shorter than the tube; *style* hairy at the top.

Border of fields, woods and meadows. June. July. Per. *Stem* 2 to 3 feet long, slender, square. *Leaflets* ½ to ¾ inch long, ¼ inch wide. *Flowers* 10 to 20 in a long, dense, one-sided raceme pale-purple. *Legume* oblong, compressed, coriaceous, smooth.

* *Annual. Naturalized.*

4. V. TETRASPERMA, L. *Slender Vetch.*

Smooth; *leaflets* 8 to 12, linear-oblong, obtuse; *stipules* lanceolate, semi-sagittate; *peduncles* mostly 2-flowered; *calyx* teeth unequal; *legume* oblong, smooth, mostly 4-seeded.

Fields and banks of streams; introduced. May, June. *Stems* almost filiform 1 to 2 feet long. *Leaflets* ½ inch long, 1 line wide, acute or obtuse. *Flowers* very small, white, or bluish-white, sometimes 3 or 4 together.

5. V. SATIVA, L. *Common Vetch or Tare.*

Somewhat pubescent; *stem* simple; *leaflets* 10 to 14, ovate-oblong or linear-oblong, notched and mucronate at the apex; *calyx-teeth* equal; *legume* linear, several-seeded.

Cultivated fields and waste places; introduced. June. *Stem* 1 to 2 feet high, erect or decumbent. *Leaflets* ¾ to 1 inch long, ¼ wide. *Flowers* ½ inch long, pale-purple. *Legume* 1 to 2 inches long, erect, roundish, reticulated, smooth.

6. V. HIRSUTA, Koch. *Hairy Vetch.*

Leaflets 8 to 20, linear, or linear-oblong, truncate, mucronate; *stipules* semi-sagittate, narrow; *peduncles* 3 to 6-flowered, shorter than the leaves; *legumes* oblong, hairy, 2-seeded.

A creeping weed in cultivated fields; introduced. May, June. *Stem* 2 to 3 feet long, much branched and diffused. *Leaflets* about ½ inch long, very narrow. *Flowers* very small, bluish-white. *Legumes* short, with roundish compressed brown seeds.

2. LATHYRUS. Linn. VETCHLING.

Gr. *Lathuros*, a leguminous plant of Theophrastus.

CALYX 5-cleft, the upper teeth shorter papilionaceous. STAMENS diadelphous. STYLE flattish, not grooved above, hairy along the inner side. LEGUMES oblong, several-seeded, 2-valved, 1-celled.—*Herbaceous mostly climbing plants with abruptly pinnate leaves, and petioles produced into branching tendrils.*

1. L. VENOSUS, Muhl. *Veiny Vetchling.*

Stem climbing, square, naked; *leaflets* 5 to 7 pairs ovate-oblong, obtuse, subopposite, mucronate, veined, often downy beneath; *stipules* very small, semi-sagittate; *peduncles* many-flowered.

Shady banks and low meadows. July, Aug. Per. *Stem* 2 to 3 feet long, climbing, mostly smooth. *Leaflets* 1½ to 2 inches long, variable in width. *Peduncles* many-flowered, about the length of the leaves. *Corolla* purple. *Legumes* flat and narrow.

2. L. PALUSTRUS, L. *Marsh Vetchling.*

Stem slender, often wing-margined; *leaflets* 3 to 4 pairs, lanceolate, linear, or narrow-oblong, mucronate; *stipules* semi-sagittate, acute; *peduncles* 3 to 5-flowered.

Low grounds, wet meadows and thickets. June, July. Per. *Stem* 2 to 3 feet long, square, broadly-winged at the angles, supported by the tendrils. *Leaflets* variable in width, somewhat coriaceous. *Flowers* drooping, rather large, variegated with blue and purple.

3. L. MYRTIFOLIUS, Muhl. *Myrtle-leaved Vetchling.*

Stem slender, weak, square; *leaflets* 2 to 3 pairs, oblong-lanceolate, acute, mucronate; *stipules* semi-sagittate, lanceolate, acuminate; *peduncles* 3 to 6-flowered, longer than the leaves.

River banks and marshy places. July, Aug. Per. *Stem* about 3 feet long. *Leaflets* 1 to 2 inches long, ½ as wide. *Flowers* pale-purple, somewhat resembling L. *palustris*, but has a more slender stem, and broader leaflets and stipules.

4. L. OCHROLEUCUS, Hook. *Pale Vetchling.*

Stem slender; *leaflets* in 3 to 4 pairs, ovate, obtuse, mucronate, reticulate beneath; *stipules* large, half-cordate; *peduncles* 4 to 10-flowered, shorter than the leaves.

Hillsides and banks of streams. June, July. Per. Whole plant smooth, pale and somewhat glaucous. *Stem* 1 to 2 feet long, often erect. *Leaflets* 1 to 1½ inches long, ¾ as wide, larger than the stipules. *Peduncles* axillary. *Flowers* large, pale yellow. *Legume* compressed, smooth.

CULTIVATED EXOTICS.

5. L. LATIFOLIUS, *Everlasting Pea.*

Leaflets 2, lanceolate; *joints* membraneous, winged; *peduncles* many-flowered. A very showy perennial plant; native of England. *Stem* 6 feet long, climbing, winged between the joints. *Flowers* large, pink, clustered on a peduncle 6 to 10 inches long.

6. L. ODORATUS, *Sweet Pea.*

Leaflets 2, ovate-oblong; *peduncles* 2-flowered; *legume* hirsute. A well known garden annual, native of Sicily. The flowers appear in June, are large sweet scented, varigated with red, purple and white.

7. L. SATIVUM, *Chick Pea.*

Leaflets 2 to 4; *peduncles* 1-flowered; *legume* ovate, compressed, with 2-winged magins at the back. A common annual; native of S. Europe where it has been sometimes cultivated for food; but has proved to be a slow poison.

3. PISUM. Linn. Pea.

Lat. *pisum*, pea.

Calxy segments leafy, the 2 upper shortest. Banner large, reflexed. Stamens 9 and 1-diadelphous. *Style* compressed, carinate, villous on the upper side. *Legume* oblong, tumid, many-seeded. Seeds globose, with an orbicular hilum.—*Herbaceous climbing plants, with abruptly pinnate leaves, ending with branching tendrils.*

1. P. sativum, L. *Common Garden Pea.*

Leaflets ovate, entire, usually 4; *stipules* ovate, semi-cordate at base, crenate; *peduncles* several-flowered. A valuable annual garden plant, cultivated from time immemorial, so that its native country is unknown. Whole plant smooth and glaucous. *Stem* 2 to 5 feet long climbing by tendrils. *Leaflets* 2 to 3 inches long, ⅔ as wide, obtuse, mucronate. *Flowers* 2 or more, on axillary peduncles, large, white.

4. CICER. Tourn. Chick Pea.

The Latin name for a species of *vetch;* applied to this genus.

Calyx 5-parted, the 4 upper segments incumbent on the vexillum; *tube* more or less gibbons at base on the upper side. Legume turgid, 2-seeded. Seeds gibbous, mucronate.—*A cultivated annual, with odd-pinnate leaves, and white solitary or axillary flowers.*

1. C. arietinum, L. *Coffee Pea. Chick Pea.*

Leaves odd-pinnate; *leaflets* cuneate-obovate, serrate; *stipules* lanceolate, subdenticulate; *calyx* slightly gibbous. Cultivated in gardens; the seeds are said to afford a tolerable substitute for coffee. *Stem* 9 to 18 inches high, branching. *Leaflets* in 4 to 6 pairs, ½ inch long, ¼ wide, with a terminal odd one. *Flowers* white. *Legume* nearly 1 inch long. *Seeds* gibbous, in form much resembling a ram's head.

5. FABA. Tourn. Windsor Bean.

The Latin name for a *bean;* appropriated to this genus.

Calyx tubular, 5-cleft, 2 upper segments shorter. Style bent at a right angle with the ovary. Stigma villose. Legume large, coriaceous, somewhat tumid. Seeds oblong with a terminal hilum.—*Herbaceous plants, apparently without tendrils, and simple, erect, axillary racemes of flowers.*

1. F. vulgaris, Mœnch. *Horse Bean.*

Leaflets 2 to 4, oval, mucronate; *stipules* semi-sagittate, obliquely ovate. Native of Egypt. Cultivated in gardens. *Stem* rigidly erect, with axillary, many-flowered racemes, 1 to 2 feet high. *Flowers* white, with a large black spot on each wing. *Legume* torulose.

TRIBE 2. PHASEOLEÆ. *The Bean Tribe.*

Twining or trailing plants, with odd-pinnate leaves of 3-several leaflets, mostly stipellate, destitute of tendrils; flowers often in racemes.

6. PHASEOLUS. Linn. KIDNEY BEAN.

CALYX companulate, 5-cleft or 5-toothed, the 2 upper teeth more or less united. KEEL of the COROLLA with the included stamens and style spirally coiled or incurved. LEGUME linear or falcate more or less compressed, many-seeded, tipped with the hardened base of the style.—*Herbaceous twining or trailing plants, with stipellate pinnately trifoliate leaves, and knotty or compressed racemes of flowers.*

1. P. PERENNIS, Walt. *Wild Bean-vine.*

Stem twining, pubescent; *leaflets* ovate, short-acuminate, 3-nerved; *racemes* solitary or somewhat clustered, simple or in pairs, axillary, longer than the leaves; *legume* pendulous.

Dry woods; common. July. Per. *Stem* 4 to 10 feet long, somewhat branching. *Leaflets* 1½ to 3½ inches long, ⅔ as wide, terminal one often sub-cordate. *Raceme* 6 to 12 inches long, loose. *Flowers* numerous, purple and violet, handsome. *Legume* about 2 inches long, ½ inches wide scythe-shaped, broad, mucronate. *Seeds* dark-purple.

2. P. DIVERSIFOLIUS, Pers. *Lobed Bean-vine.*

Leaflets broad-ovate, angular, 2 to 3-lobed, some of them oblong-ovate and entire; *peduncles* angled, longer than the leaves; *flowers* in heads; *legume* broadly linear, round.

Sandy fields and woods. Aug. Annual. *Stem* 2 to 6 feet long. *Leaflets* 1 to 2 inches long, ¾ as wide, with scattered hairs beneath, sometimes more or less 3-lobed. *Peduncles* 4 to 6 inches long, 2 to 3-flowered. *Flowers* purple. *Legume* 5 to 7-seeded, black when ripe.

3. P. HELVOLUS, L. *Long-stalked Bean-vine.*

Stem slender, hairy, twining, diffuse, or prostrate; *leaflets* ovate or oblong, entire; *stipules* lanceolate; *peduncles* 3 to 6 times the length of the beans; *flowers* few, in heads; *legume* narrow-linear, cylindric, 8 to 10-seeded, slightly pubescent.

Sandy fields. July—Sept. Per. *Stem* 3 to 5 feet long. *Leaflets* 1 to 2 inches long, ¼ to 1 inch wide. *Peduncles* 4 to 8 inches long, 4 to 7-flowered. *Calyx* with 2 lance-oblong nerved *bracts* at base. *Corolla* purplish; *vexillum* large, roundish. *Legumes* 2 to 3 inches long, very narrow, subfalcate. *Seeds* woolly.

CULTIVATED EXOTIC SPECIES.

4. P, VULGARIS, L. *Pole Bean. Kidney Bean.*

Stem twining; *leaflets* ovate acuminate; *raceme* solitary, shorter than the leaves; *pedicels* in pairs; *calyx* as short as its 2 bracts at base; *legume* pendulous. *Seeds* reniform. Annual. Native of the East Indies. Universally cultivated in gardens for table use. *Flowers* mostly white.

5. P. LUNATUS, L. *Lima Bean.*

Stem twining; *leaflets* ovate, deltoid, acute; *raceme* shorter than the leaves; *peduncles* in pairs; *calyx* longer than its 2 bracts at base; *legume* short, sword-shaped or lunate; *seeds* large, much compressed, purplish-white. Annual. Native of the East Indies. *Stem* 6 to 8 feet long. *Flowers* small, white. Valued in cultivation.

6. P. MULTIFLORUS, L. *Scarlet Pole Bean.*

Stem twining; *leaflets* ovate, acute; *raceme* solitary, as long as the leaves; *calyx* longer than the 2 appressed bracts at base; *legume* pendulous; *seeds* kidney-shaped. Annual. Native of S. America. *Flowers* scarlet, numerous, and very brilliant.

7. P. NANUS, L. *Bush Bean.*

Stem smooth, very branching, erect; *leaflets* broad-ovate, acute; *calyx* shorter than its 2 bracts at base; *legume* pendulous, compressed, rugose. Annual. Native of India. *Stem* 1 foot high. *Flowers* white. *Seeds* white, small. Much cultivated.

7. APIOS. Bœrh. GROUND-NUT.

Gr. *apios*, a *pear;* in allusion to the form of its tuberous roots.

CALYX companulate, obscurely 2-lipped; the upper lip of 2 short rounded teeth. STANDARD very broad, with a longitudinal fold in the centre, reflexed. KEEL long, falcate, and with the stamens and style at length spirally twisted. LEGUME straight or slightly curved, rounded, many-seeded.—*A perennial twining herb, with pleasant tasted tubers on underground shoots, pinnately* 5 *to* 7 *foliate leaves and dense, short, often branching racemes of flowers on knotty peduncles.*

1. A. TUBEROSA, Mœnch. *Ground-nut.*

Stem twining; *leaflets* 5 to 7, ovate-lanceolate; *raceme* shorter than the leaves.

Low grounds, thickets and shady woods. July, August. *Root* producing oval tubers about ½ inch in diameter, very nutritious. *Flowers* in short oval racemes, purple and brown, fragrant.

8. GALACTIA. P. Brown. MILK PEA.

Gr. *gala*, milk; in allusion to the juice of some of the species.

CALYX 4-cleft, equal, the upper lobe broadest. KEEL scarcely incurved. STANDARD incumbent, broad. LEGUMES compressed, linear, many-seeded.—*Low mostly prostrate or twining perennials, with pinnately trifoliate stipellate leaves, and axillary racemes of flowers.*

1. G. GLABELLA, Michx. *Smooth Milk Pea.*

Stem nearly smooth, prostrate, somewhat twining; *leaflets* elliptical or ovate-oblong, obtuse or notched, sometimes slightly hairy beneath; *racemes* axillary, simple, few-flowered, on peduncles as long as the leaves; *calyx* smooth; *legume* pubescent.

Sandy woods. July, Aug. *Root* fusiform. *Stem* 2 to 4 feet long. *Leaflets* 1 to 1½ inches long by ½ to 1 inch wide, varying in form from elliptic through oblong to ovate. *Flowers* rather large, reddish-purple, greenish externally.

2. G. MOLLIS, Michx. *Soft Milk Pea.*

Stem twining, softly villous; *leaflets* ovate-oblong, obtuse, nearly smooth above, softly villose and whitish beneath; *racemes* longer than the leaves, pedunculate; *calyx* acuminate villous, *legume* compressed, villous.

Dry soils, pine barrens, &c.; Southern part of the State. July, Aug. *Stems* prostrate or climbing. *Leaflets* about 1 inch long, ⅔ as wide. *Flowers* about half as long as in the last.

9. CENTROSEMA. DC.

Gr. *kentron*, a *spur*, and *sema*, the *standard*.

CALYX tubular, 5-toothed; the teeth much shorter than the tube. STANDARD very large, with a spur-shaped projection on the back, notched at the top. KEEL small, shorter than the wings, incurved, acute, on long claws. STYLE dilated at the apex, longitudinally bearded. LEGUME linear-oblong, flat, pointed with the awl-shaped style, many-seeded.—*Twining perennials, with pinnately* 3 *to* 5-*foliate leaves, and large showy flowers.*

1. C. VIRGINIANA, Benth. *Spurred Butterfly Pea.*

Rather roughish with minute hairs; *stem* twining; *leaflets* varying from oblong-ovate to linear, very veiny, shining; *peduncles* 1 to 4-flowered; *calyx* about as long as the lanceolate bracts, teeth linear-awl-shaped; *legume* linear, compressed.

Sandy dry soils. July. Stipules, bracts, and bractlets striate, the latter longer than the calyx. *Flowers* large, purple, 1 to 2 inches long. *Pods* straight and narrow, 4 to 5 inches long, thickened at the edges, the valves marked with a line on each side next the margin.

10. AMPHICARPA. Ell.

Gr. *amphi*, around, *karpos*, fruit; in reference to the ovary at base, sheathed.

CALYX tubular, companulate, 4 (rarely 5) toothed with nearly equal segments, with no bractlets. KEEL and *wing-petals* similar, nearly straight, the standard partly folded round them. STIGMA capitate. OVARY on a sheathed stipe. LEGUME of the upper flowers flat, 2 to 4-seeded.—*Low slender twining perennials, with pinnately trifoliate leaves, and* 2 *kinds of flowers, the upper ones perfect but seldom ripening fruit; lower ones apetalous and fruitful.*

A. MONOICA. Nutt. *Hog Pea-nut.*

Stem hairy; *leaflets* ovate, acute, smooth; *raceme* of the stem with nodding, pendulous petaliferous (generally barren) flowers; *bracts* shorter than the pedicels; *calyx* teeth short and broad.

Rich woodlands. July—Sept. A delicate slender herb, with pale-purplish or whitish flowers. *Legume* of the stem smootish, with 3 to 4 dark-purple seeds. *Radical legumes* hairy, often very numerous, obovate or pear-shaped, fleshy, repining usually but one large seed.

11. WISTARIA. Nutt.

In memory of *Casper Wistar, M. D.*, President of Am. Philo. Soc.

CALYX bilabiate, upper lip emarginate, the lower one with sub-equal teeth. VEXILLUM with 2 hard bunches ascending the claw and separating above. WINGS and KEEL sickle-shaped, the former adhering at top. LEGUME uneven or swelling. SEEDS numerous, kidney-shaped.—*Twining shrubby plants, with pinnate leaves, and large racemes of blue-colored flowers with large colored bracts.*

1. W. FRUTESCENS, DC. *American Wistaria.*

Stem pubescent, when young, at length smooth; *leaflets* 9 to 13, ovate or elliptical-lanceolate, acute, slightly pubescent; *wings* with 2 auricles at base; *ovaries* smooth.

Rich alluvial soils: Western parts of the State. April, May. An ornamental vigorous vine, 6 to 10 feet long, climbing over bushes, &c. *Leaflets* 1 to 2 inches long, ½ to 1 inch wide. *Flowers* numerous, on racemes 4 to 8 inches long, lilac. *Bracts* very conspicuous, sheathing the racemes. *Seeds* spotted.

2. W. CONSEQUANA, Benth. *Chinese Wistarta.*

Stem of rapid growth, 12 to 15 feet long. *Leaflets* 9 to 13, ovate-lanceolate, silky-pubescent. *Flowers* numerous, loose, in long terminal nodding racemes, clustered. A splendid flowering vine from China. May, June.

TRIBE 3. HEDYSAREÆ. *The Saintfoin Tribe.*

Stamens monodelphous or diadelphous. Legume (a loment) separating transversely into 2-several 1-seeded indehiscent joints, or rarely reduced to 1 such joint.

12. ÆSCHYNOMENE. Linn. SENSITIVE JOINT VETCH.

Gr. *aischunomene*, to be *modest* or *ashamed*; alluding to its sensitive properties.

CALYX 2-lipped, the upper lip 2-cleft, the lower 3-cleft. VEXILLUM roundish. KEEL PETALS boat-shaped, distinct at base. STAMENS diadelphous, in 2 sets, 5 in each set. LEGUME exserted, flattened, composed of several square easily seperable 1-seeded joints.—*Leaves odd pinnate, sometimes sensitive, as if shrinking from the touch.*

Æ. HISPIDA, Willd. *Sensitive Æschynomene.*

Rough, bristly; *stem* erect; *leaflets* very smooth and numerous, 20 to 25 pairs, linear, obtuse; *stip.* ovate, acuminate; *racemes* 3 to 5-flowered; axillary *loment* compressed, 6 to 10 jointed.

Along rivers and in marshes. Aug. *Stem* 2 to 3 feet high. *Leaflets* about ¾-inch long. *Racemes* usually bearing a leaf. *Flowers* yellow, tinged with red externally. *Legume* 2 inches long, stalked, 6 to 10-jointed.

13. HEDYSARUM. DC.

CALYX 5-cleft, segments linear-subulate, nearly equal. STANDARD large. KEEL obliquely truncate. WINGS much shorter than the keel. STAMENS diadelphous (9 and 1). LEGUME with many joints; *joints* compressed, roundish 1 seeded.—*Mostly herbaceous plants with odd pinnate leaves, not stipellate.*

1. H. BOREALE, Nutt. *Northern Hedysarum.*

Leaves nearly sessile; *leaflets* 8 to 12 pairs, oblong smoothish; *stipules* sheathing, subulate; *racemes* on long peduncles; *legumes* with smooth roundish joints.

Mountains. June, July. Per. *Stem* 10 to 20 inches high, rather stout, very leafy. *Leaflets* ½ to ¾ inches long, ¼ to ⅓ wide, obtuse, mucronate. *Racemes* 2 to 4 inches long, on rigid peduncles 3 to 5 inches long. *Flowers* large and handsome, violet-purple, numerous.

14. DESMODIUM. DC.

Gr. *demos*, a *chain;* from the appearance of the jointed pods.

CALYX mostly 2-lipped, upper lip 2-parted, lower one 3-parted. STANDARD roundish. KEEL obtuse, not truncate, shorter than the wings. STAMENS diadelphous (9 and 1), or monadelphous, below the middle. LEGUME flattened, composed of several square easily separable joints.—*Herbaceous perennial plants, with pinnately-trifoliate leaves, stipellate; and flowers in axillary or terminal racemes, often panicled, purple, or purplish, often turning green in drying; loments mostly hoary with minute-toothed hairs by which they adhere to the fleece of animals or to clothing.*

* *Stem erect or ascending; Stamens all connected: calyx toothed or entire: raceme terminal panicled, or the pedicels often clustered: legumes long-stalked.*

1. D. NUDIFLORUM, DC. *Naked-flowered Tick-Trefoil.*

Leaflets roundish-ovate, acuminate; *scape* radical, smooth, panicled; *joint* of the legume, obtusely triangular.

Dry open woods; common. Aug. *Stem* 8 to 10 inches high, remarkably distinguished by having its leaves and flowers on separate stalks, often distant from each other. *Leaflets* ternate, 3 to 4 inches long, 1 to 2 or 3 inches wide, whitish. *Scape* 1 to 3 feet long, slender, smooth, leafless. *Flowers* purple.

2. D. ACUMINATUM, DC. *Pointed-leaved Desmodium.*

Leaves all crowded at the summit of the stem, on very long petioles: *leaflets* round-ovate, acuminate; *panicle* terminal, on a very long peduncle; *joints* of the legume 2 to 3, semi-oval, pubescent.

Shady woods. July, Aug. Whole plant slightly hairy. *Stem* about 1 foot high, ending in a slender panicle 1 to 2 feet long. *Leaflets* 3 inches in diameter, terminal one orbicular, ovate, 4 to 5 inches long. *Flowers* pale-purple or flesh-color.

3. D. PAUCIFLORUM, DC. *Few-flowered Desmodium.*

Leaves scattered along the low ascending stems; *lateral leaflets* obliquely-ovate, the terminal one dilated, rhomboid-ovate, all sub-acuminate and pubescent-ciliate; *raceme* few flowered, terminal; *legume* stipitate.

Woods; rare. Aug. *Stem* 6 to 9 inches high, decumbent or sub-erect. *Petioles* 2 to 3 inches long. *Leaflets* 1 to 3 inches long, ¾ as wide. *Flowers* 2 to 6, white or reddish white, in a loose slender raceme. *Legume* with 2 to 3 semi-oval pubescent joints slightly connected.

* * *Stems prostrate; legumes short stalked, of 3 to 5 joints.*

4. D. HUMIFUSUM, Beck. *Running Desmodium.*

Smooth; *stem* procumbent; *leaflets* ovate or oval; *stipules* ovate-lanceolate; *racemes* axillary and terminal, elongated; *joints* of the *legume* sub-rhomboid.

Woods, rare. Aug. *Stem* 2 to 3 feet long. *Leaflets* sub-acute. *Flowers* purple. Resembles the next.

5. D. ROTUNDIFOLIUM, DC. *Round-leaved Desmodium.*

Hairy all over; *leaflets* orbicular; *stipules* broad-oval, acuminate, reflexed; *racemes* axillary and terminal; *legume* with 3 to 5 rhomboid-oval hisped joints.

Dry rocky woods. Aug. *Stem* extensively trailing, usually very hairy, 2 to 4 feet long. *Leaflets* pale beneath, 1 to 2 inches in diameter, on hairy stalks. *Flowers* few, purple.

* * * *Stems* (tall) *erect; legumes of* 4 *to* 7 *inequilateral joints which are longer than broad; flowers large.*

6. D. CANADENSE, DC. *Canadian Desmodium.*

Stem hairy, striate; *leaflets* oblong-lanceolate, much longer than the petioles, nearly smooth above; *stipules* lanceolate, acuminate, large; *racemes* dense, erect, in a terminal panicle; *joints* of the *legume* 3 to 4, ovate, triangular, hisped.

Dry woods. July. *Stem* 3 to 6 feet high, often branched. *Petioles* very short, ¼ to ⅓ inch long. *Leaflets* 2 to 3 inches long, broadest at base, pointed, nearly smooth. *Flowers* pale violet or blue. *Racemes* with conspicuous bracts.

7. D. CANESCENS, DC. *Hoary Desmodium.*

Stem branching, striate, hairy and scabrous; *leaflets* ovate, bluntish, about the length of the petioles, scabrous, pubescent on both sides; *stipules* large, broadly-ovate, persistent; *flowers* in a loose terminal panicle; *legume* with 4 or 5 unequally rhomboidal reticulated strongly hisped joints.

Moist grounds. Aug. An upright branching plant 3 to 5 feet high with very long panicles of flowers, greenish externally, purple within. *Leaflets* 2 to 4 inches long. *Branches* clothed with minute and hooked glutinous hairs, and the fine partly hooked pubescence of the leaves cause them to adhere to cloth.

8. D. CUSPIDATUM, T. & Gr. *Sharp-pointed Desmodium.*

Very smooth: *stem* erect; *leaflets* ovate or lance-ovate, very acute, or acuminate; *stipules* obliquely lanceolate; *bracts* large, lance-ovate, acuminate; *panicle* terminal, elongated, rather slender; *joints* of the *legume* rhomboid-oblong.

Along streams, thickets and shady places; common. July, Aug. *Stem* rather simple, 3 to 5 feet high. *Leaflets* 2 to 5 inches long, widest at base, smooth, entire, green on both sides. *Bracts* and *stipules* ¾ inch long. *Flowers* large, purple. *Legumes* about 6-jointed.

* * * * *Stem erect; racemes panicled; stipules and bracts small and inconspicuous.*

9. D. VIRIDIFLORUM, Beck. *Green-flowered Desmodium.*

Stem very downy, rough at the summit; *leaflets* broadly-ovate, obtuse, scabrous on the upper surface, villous and very soft beneath; *panicle* terminal, very long, naked; *legume* with 3 to 4 roundish triangular hisped joints.

Woods and thickets; frequent. Aug. *Stem* 3 to 4 feet high, rigid, branched, very scabrous towards the summit. *Leaflets* 2 to 3 inches long, 1 to 2½ inches wide. *Flowers* purplish, turning blue-green in withering. *Legume* 1 to 2 inches long.

10. D. DILLENII, Darl. *Dillenius' Desmodium.*

Stem pubescent, branching; *leaflets* oblong or ovate-oblong, pale beneath, softly and finely pubescent; *stipules* subulate; *racemes* slender, forming a loose terminal panicle; *legume* with 3 to 4 rhomboid reticulated hisped joints.

Open woodlands; common. Aug. A variable species 2 to 3 feet high. *Leaflets* 2 to 3 inches long, obtuse, sometimes acute. *Flowers* purple, changing to bluish-green.

11. D. PANICULATUM, DC. *Panicled Desmodium.*

Nearly smooth; *stem* slender, erect; *leaflets* oblong-lanceolate, rather obtuse, smoothish; *stipules* subulate; *panicle* terminal; *legumes* with 3 to 4 rhomboidal joints.

Woods; common. July, Aug. *Stem* 2 to 3 feet high, slender, often branching. *Leaflets* 3 to 5 inches long, 2 to 3½ wide. *Flowers* purple, numerous, in a paniculate raceme. *Legumes* large; *joints* pubescent.

12. D. RIGIDUM, DC. *Rigid Desmodium.*

Stem branching, somewhat hoary; *leaflets* ovate-oblong, rather obtuse; terminal ones the longest, reticulated-veiny, rather rough above, hairy beneath; *racemes* paniculate, erect, very long; *legumes* with 2 to 3 half-round or oval hisped joints.

Dry woods and hillsides. Aug. *Stem* 2 to 3 feet high, often with numerous, long, erect, rigid branches. *Leaflets* 1 to 3 inches long, ½ as wide, rather leathery reticulately veined. *Flowers* small, purple.

13. D. CILIARE, DC. *Fringed Desmodium.*

Stem slender, hairy, or rough pubescent; *leaves* crowded on very short hairy petioles; *leaflets* small, round-ovate or oval, obtuse, thickish, more or less hairy on the margins and underneath; *stipules* subulate-linear; *racemes* paniculate, terminal.

Dry hills and sandy fields; common. Aug. *Stem* about 2 feet high. *Leaflets* ½ to 1 inch long, ¼ to ¾ wide. *Flowers* violet-purple. *Legumes* of 2 to 3 semi-orbicular hispid joints.

14. D. MARILANDICUM, Booth. *Smooth-leaved Des'm.*

Nearly smooth throughout; *stem* erect, simple, slender; *leaflets* ovate or roundish, very obtuse, often sub-cordate, thin; *petiole* as long as the lateral leaflets, smooth; *panicle* elongated; *legume* with 2 to 3 hisped semi-orbicular joints.

Fields and woods; common. July, Aug. *Stem* 2 to 3 feet high, nearly smooth. *Leaflets* about ¾ inch long. *Flowers* small, violet-purple, in a terminal erect panicle.

15. LESPEDZA. Michx.

In honor of *Lespedez*, a Spanish Governor of Florida.

CALYX 5-cleft, segments nearly equal, slender. STAMENS diadelphous (9 and 1); *anthers* all alike. LEGUME of a single 1-seeded joint, oval or roundish, flat, reticulate, not opening, 1-seeded.—*Perennials with pinnately trifoliate leaves, minute stipules and bracts, and often polygamous flowers.*

* *Flowers of 2 kinds, perfect, and apetalous, the latter chiefly bearing the fruit; corolla violet or purple, much longer than the calyx.*

1. L. PROCUMBENS, Michx. *Procumbent Lespedeza.*

Stems procumbent, slender, with the branches assurgent, all over pubescent; *leaves* on long petioles; *leaflets* oval or elliptical, obtuse, mucronate *peduncles* slender, mostly simple, few flowered; *legume* orbicular ovate, pubescent.

Sandy soil. Aug., Sept. *Stems* several from the same root, 2 to 3 feet long. *Leaves* consisting of 3 oblong or roundish leaflets on hairy stalks. *Flowers* purple, in short raceme-like heads, axillary; the lower ones apetalous, on short peduncles, the upper ones on long filiform peduncles.

2. L. VIOLACEÆ, Pers. *Violet-flowered Lespedeza.*

Stems upright or spreading, somewhat pubescent; *leaves* on long petioles; *leaflets* elliptic or oval-oblong, obtuse or emarginate, somewhat hairy; *racemes* sub-umbellate, axillary, about as long as the leaves, *lower ones* with apetalous flowers;

flowers in pairs, distinctly pedicellate; *legume* rhomboidal, reticulate and smooth, much longer than the calyx.

Dry woods. July. *Stems* clustered, slender, 8 to 14 inches long. *Apetalous flowers* few, perfect ones seldom producing fruit. *Leaflets* ½ to 1 inch long, ⅓ to ⅔ inch wide. *Petioles* ¾ to 1½ inches long. *Flowers* violet-colored, small.

Var. b. *divergens*, (L. *divergens* of Pursh). *Pedicels* filiform, divergent, much longer than the leaves; *flowers* in loose panicles mostly unfruitful; *legume* reticulate; *leaflets* oval or oblong.

Var. c. *sessiliflora*. (L. *sessiliflora* of Nutt.) *Leaves* on short petioles; *fascicles* of flowers subsessile, on peduncle much shorter than the leaves.

Var. d. *angustifolia*. (L. *angustifolia*, Raf. L. *reticulata*. Pers.) *Leaves* crowded; *leaflets* narrowly oblong or linear, often silky; *flowers* clustered on straight branches. I have followed Torrey and Gray in giving the above only as varieties of L. *violaceæ*.

* * *Stems upright; Flowers all alike and perfect, in spikes or heads.*

3. L. CAPITATA, Michx. *Shrubby or Capitate Lespedeza.*

Stem erect, sub-simple, villose; *leaflets* elliptic-ovate, pubescent beneath; *common petioles* very short; *spikes* capitate, ovoid, on short axillary peduncles; *legumes* elliptic ovate, pubescent much shorter than the calyx.

Dry sandy soil. July, Aug. *Stem* 2 to 4 feet high, rigid, straight, woolly. *Leaves* numerous, on short petioles. *Leaflets* 1 to 1½ by ¼ to ½ inches, nearly smooth above. *Flowers* in oblong or sub-globose heads, white or very pale yellow.—Var. *angustifolia* slender; *leaflets* linear; *peduncles* sometimes elongated.

4. L. HIRTA, Ell. *Hairy Lespedeza.*

Stem branched, very villose; *leaves* on very short slender petioles; *leaflets* round, oval, obtuse, hairy; *spikes* oblong-cylindric; *peduncles* longer than the leaves, axillary.

Dry hilly woodlands; frequent. Aug., Sept. *Stem* 2 to 4 feet high, very hairy. *Leaflets* ⅔ to 1½ inches long, ½ to 1 inch wide. *Legume* compressed, elliptic-ovate, very hairy, nearly as long as the calyx segments.

5. L. NUTTALLII, Darl. *Nuttall's Lespedeza.*

Stem hairy, somewhat branched; *leaflets* ovate and obovate, villose beneath; *racemes* somewhat spiked, pedunculate, longer than the leaves; *legume* lance-ovate, acuminate, very pubescent, rather longer than the calyx.

Dry hills; frequent. Aug., Sept. *Stem* 2 to 3 feet high, striate. *Leaflets* ½ to 1¼ inches long, ⅓ inch wide. *Flowers* rather crowded in somewhat spiked peduncled racemes, mostly longer than the leaves, purple with tinges of violet.

16. STYLOSANTHES. Swarts.

Gr. *stulos*, a *column*, and *anthos*, a *flower;* the flowers appearing stipitate.

Tube of the CALYX very long, slender; *limb* 2-lipped, upper 2, the lower 3-cleft. COROLLA inserted in the throat of the calyx. STAMENS monodelphous; 5 of the anthers linear, the 5 alternate ones ovate. FERTILE FLOWERS with a hooked style. LEGUME reticulated with 1 to 2 joints, the lower joint when pressed empty and stalk-like, the upper ovate, 1-(2)-seeded.—*Low perennials, with pinnately 3-foliate leaves; the stipules united with the petioles, and 2 kinds of flowers intermixed in the clusters; one kind complete but unfruitful, the other fertile and consisting only of a pistil between 2 bractlets.*

1. S. ELATIOR, Swarts. *Pencil Flower.*

Stem erect, herbaceous, somewhat branched above, often several from the root; *leaflets* lanceolate, strongly straight-veined, smooth, acute; *upper stipules* sheathing; *spikes* few flowered.

Sandy woods and pine barrens. July—Sept. *Stems* 6 to 12 inches long, wiry, often bristly. *Leaflets* ¾ to 1¼ inches long, ⅛ to ¼ wide. *Bracts* lanceolate, hisped ciliate. *Flowers* yellow, in terminal compact heads. *Legume* 2-jointed, the lower joint sterile and stipitate, 1-seeded, hooked at the summit.

TRIBE 4. LOTEÆ. *The Melilot Tribe.*

Stamens monodelphous or diadelphous (9 *and* 1); *Legume continous* 1-*celled, or* 2-*celled lengthwise. Not twining, climbing, nor bearing tendrils.*

17. ASTRAGALUS. Linn. MILK VETCH.

CALYX 5-toothed or cleft. COROLLA with the *keel* obtuse. STAMENS diadelphous. LEGUME 2-celled by the introflection of the lower suture.—*Herbaceous or suffruticose plants, with odd-pinnate leaves, and spiked or racemed flowers.*

1. A. CANADENSIS, L. *Canadian Milk Vetch.*

Tall and erect; *stem* downy; *leaflets* 10 to 14 pairs with odd one elliptic-oblong, rather obtuse, smoothish; *stipules* broad-lanceolate, acuminate; *peduncles* about as long as the leaves; *flowers* in oblong spikes; *legume* ovate-oblong, erect, smooth, 2-celled, many-seeded.

Banks of streams. June—Aug. Per. *Stem* 1 to 3 feet high, bushy, very leafy. *Leaflets* usually smooth above, slightly pubescent beneath. *Flowers* pale-yellow, in spikes 1 to 4 inches long. *Legume* ½ inch long, leathery.

18. ROBINIA. Linn. LOCUST.

In honor of *John* and *Vespasian Robin*, French botanists.

CALYX short, 5-toothed, teeth lanceolate, 2 upper ones approximate. VEXILLUM large. KEEL obtuse. STAMENS diadelphous (9 and 1). STYLE bearded. LEGUME compressed, elongated, margined on the seed-bearing edge.—*Trees or shrubs with stipular prickly spines, unequally pinnate leaves, and showy axillary racemes of flowers.*

1. R. PSEUDACACIA. *Locust Tree.*

Leaflets 8 to 12 pairs ovate and oblong; *stipules* prickly; *racemes* pendulous, loose, slender; *legumes* smooth.

A handsome tree, native in our mountainous regions, much cultivated for its invaluable timber. May. *Flowers* white, fragrant, in racemes 3 to 6 inches long.

2. R. VISCOSA, Vent. *Clammy Locust.*

Branchlets, &c., clammy; *leaflets* ovate; *stipular spines* very short.

A handsome tree cultivated like the last; native of the Southern Alleghenies where it attains the height of 40 feet. *Flowers* numerous, crowded, rose-colored in erect, crowded axillary racemes.

3. R. HISPIDA, L. *Rose Acacia.*

Shrub mostly hispid; *stipular spines* scarcely any; *racemes* loose, sub-erect. A beautiful shrub 4 to 8 feet high, native of the Southern States, cultivated in gardens. *Flowers* deep rose color or red.

19. TEPHROSIA. Pers.

Gr. *tephros, ash-colored or hoary,* in allusion to the color of the foliage.

CALYX about equally 5-cleft. STANDARD large, roundish, pubescent, reflexed-spreading, scarcely longer than the coherent wings and keel. STAMENS monodelphous or nearly diadelphous. LEGUMES linear, flat, several-seeded.—*Silky hoary perennial herbs (except in the tropics), with odd-pinnate leaves, and white or purplish racemed flowers.*

T. VIRGINIANA, Pers. *Goat's Rue. Hoary Pea.*

Stem erect; *leaflets* 7 to 14 pairs, oval or linear-oblong, mucronate, white, villous beneath; *raceme* terminal; *legume* falcate, villous.

Sandy soils and gravelly hills; common. June, July. *Root* long and tough. *Stems* simple, usually several or many from one root. *Leaflets* 1 inch long, ¼ wide, odd one obcordate. *Stipules* subulate, ⅙ inch long, persistent. *Bracteoles* deciduous. *Calyx* very villous. *Flowers* large, in a dense terminal raceme. *Banner* white, with a tinge of yellow on the upper side. *Keel* rose-colored. *Wings* red.

20. AMORPHA. Linn. FALSE INDIGO.

Gr. *a,* privative, *morpha,* shape; alluding to the deficiencies of the corolla.

CALYX inversely conical, 5-toothed, persistent. STANDARD concave, erect; the other petals entirely wanting! STAMENS 10, exserted, monodelphous at base, otherwise distinct. STYLE filiform, straight, smooth. LEGUMES oblong, longer than the calyx, somewhat curved at the point, 1 to 2-seeded.—*Shrubs, with odd-pinnate punctate leaves, and bluish or violet-colored flowers, crowded in clustered terminal spikes.*

A. FRUTICOSA, L. *Common False Indigo.*

Rather pubescent; *stem* shrubby or arborescent; *leaflets* 8 to 12 pairs, oval, scattered, the lower pair remote from the stem; *calyx-teeth* obtuse, 4 of them acuminate, pubescent; *legume* few-seeded.

Southern part of the State. July. A tall shrub 6 to 16 feet high. *Leaves* 3 to 5 inches long. *Leaflets* about 1 inch, by ½, rather remote from each other. *Racemes* spicate, terminal, solitary or fascicled, 3 to 4 inches long. *Standard* purple, emarginate.

21. TRIFOLIUM. Linn. CLOVER-TREFOIL.

Lat. *tres,* three; and *folium,* a leaf.

CALYX persistent, tubular, 5-cleft, the teeth bristle-form. PETALS more or less united below. STANDARD longer than the wings, which are mostly longer than the keel. STAMENS diadelphous (9 to 1). LEGUME small, scarcely dehiscent, often ovate, 1 to 6-seeded, covered by and scarcely longer than the calyx. SEEDS roundish.—*Tufted or diffuse herbs, with palmately trifoliate leaves, with straight, scarcely reticulated veins, and flowers chiefly in dense heads or spikes.*

* *Flowers sessile in compact heads; corolla purple or purplish, deciduous or withering.*

1. T. PRATENSE, L. *Red Clover.*

Stems sub-erect, branched; *leaves* on long petioles, oval, entire, often notched at the end, and marked with a pale spot; *heads* of *flowers* ovate, dense, nearly sessile; *teeth* of the *calyx* setaceous, the lowest longer than the rest.

Meadows and fields; largely cultivated, and naturalized. May—Oct. Per. *Stems* 1 to 2 feet high. *Flowers* united into a tube at base, rose-colored, fragrant. *Seeds* yellowish. Native of Europe.

2. T. PENNSYLVANICUM, Willd.

Stem ascending, much branched, flexuous, *leaflets* ovate.elliptic, obtuse, very entire; *stipules* awned; *heads* of *flowers* ovate-cylindric, solitary, dense; lower teeth of the calyx shorter than the corolla.

Woods. June—Sept. Per. *Flowers* fine red. Resembles T. *medium* of Linnæus. Introduced. Beck's Bot. I suspect this to be merely a variety of T. *pratense*.

3. T. ARVENSE, L. *Rabbit-foot Clover. Stone Clover.*

Stem branching; *leaflets* obovate-linear or narrowly wedge-form, minutely 3-toothed at the apex; *stipules* oval acuminate; *spikes* oblong-cylindric, very villous; *calyx-teeth* longer than the corolla plumose, woolly.

Old fields and roadsides; common; naturalized. May—Sept. Annual. *Stem* 6 to 12 inches high, much branched round, hairy. *Leaves* hairy, in short petioles. *Leaflets* narrow, ½ to 1 inch long. *Heads* ½ to 1½ inches long becoming greyish and very softly woolly. *Flowers* minute white or pink.

* * *Corolla white or yellow; flowers in umbel-like round heads on a naked peduncle.*

4. T. REPENS, L. *White Clover.*

Smooth, the slender stem spreading and creeping; *leaflets* inversely heart-shaped, somewhat retuse, serrulate, mucronate; *stipules* scale-like narrow; *petioles* and especially the *peduncles*, very long; *heads* small and loose; *flowers* pedicelled.

Pastures, waste places, and woodlands; common. May—Oct. Per. *Stem* 6 to 10 inches high, rooting at the joints several from the same root. *Peduncles* angular much longer than the leaves. *Flowers* white, rarely purplish. *Legume* 4-seeded.

5. T. PROCUMBENS, L. *Hop Clover.*

Stems mostly procumbent, spreading, pubescent; *leaflets* wedge-ovate, notched at the end, denticulate, the lower pair at a small distance from the other; *stipules* lance-ovate, ciliate, shorter than the petioles; *peduncles* equal to or longer than the leaves; *heads* axillary, oval.

Dry fields; naturalized. May—Aug. Annual. *Stems* 3 to 6 inches long, many from the same root. *Leaves* on short petioles. *Heads* about 2-flowered, small on slender peduncles ½ to 1½ inches long. *Flowers* yellow. *Legume* 1-seeded.

6. T. AGRARIUM, L. *Golden Clover. Hop Trefoil.*

Stem ascending, with erect branches; *leaves* nearly sessile; *leaflets* oblong-ovate or wedge-shaped, denticulate, all from the same point nearly sessile; *stipules* narrow, cohering with the petiole for more than half its length; *heads* on rather long peduncles.

Sandy fields; naturalized. June—Aug. Annual. *Stem* 6 to 15 inches long, branched, minutely pubescent. *Common petiole* ¼ to 1 inch long. *Leaflets* ½ to 1 inch long, narrow. *Heads* of *Flowers* twice as large as in the last, on peduncles ½ to 1½ inches long. *Flowers* small, pale yellow, brown when old.

22. MELILOTUS. Tourn. MELILOT.

Gr. *meli*, honey, and *lotus*, the genus, so called.

FLOWERS much as in clover, but in spiked racemes, small. COROLLA deciduous. LEGUME coriaceous, ovoid, wrinkled, longer than the calyx, 1 or few-celled.—*Herbs fragrant in drying, with pinnately trifoliate leaves and racemose flowers.*

1. M. OFFICINALIS, Willd. *Yellow Melilot. Sweet Clover.*

Upright; *leaflets* obovate, obtuse, remotely serrate; *spikes* axillary, paniculate; *legume* 2-seeded, rugose; *style* filiform, as long as the legume.

Fields and waste places; introduced. Aug. Annual. *Plant* 2 to 4 feet high, branched. *Flowers* yellow, in long racemes. Native of Europe.

2. M. LEUCANTHE, Koch. *White Melilot.*

Upright, branched; *leaflets* ovate-oblong, truncate, mucronate at the apex, remotely serrate; *standard* longer than the keel and wings; *legume* 1 to 2-seeded, ovate, green.

Scarcely naturalized; common in cultivation. July, Aug. *Stem* 3 to 5 feet high. *Flowers* white, on longer and less crowded racemes than the last.

23. MEDICAGO. Linn.

Gr. *medika;* because it was introduced into Greece by the Medes.

FLOWERS nearly as in Melilotus. LEGUME many-seeded, varying in form, always falcate or twisted into a spiral.—*Herbs with palmately trifoliate leaves and more or less spiral legumes, often resembling snail shells.*

1. M. LUPULINA, L. *None-such. Black Medick.*

Stem procumbent; *leaflets* wedge-ovate, toothed at the apex; *stipules* lanceolate, acute, somewhat entire; *flowers* in capitate spikes; *legume* reniform, 1-seeded.

Waste places; naturalized. June—Aug. *Stem* 6 to 12 inches high. *Flowers* small, yellow, crowded. *Legume* black when ripe, short, compressed, curved or kidney-shaped, 1-celled, 1-seeded.

2. M. SATIVA, L. *Lucerne.*

Erect, smooth; *leaflets* ovate-oblong, toothed above, mucronate *flowers* in oblong racemes; *legume* spirally twisted.

Fields and waste places, scarcely naturalized. Sometimes cultivated for green fodder. June, July. Per. *Stem* 1 to 2 feet high. *Flowers* purple.

3. M. SCUTELLATA, L. *Snail.*

Pedicels 2-flowered. *Legume* unarmed, cochleate, orbicular, convex at the base, flat above with concentric folds. Native of South Europe. Cultivated for the curiosity of its pods, which much resemble snail shells. July. Annual.

M. INTERTEXTA a native of Europe, naturalized in some parts of the U. S. with yellow flowers and spirally legumes like the last is sometimes cultivated in our gardens.

24. CROTALARIA. Linn. Rattle-box.

Gr. *crotalon*, a *rattle;* the seeds becoming loose in the ripe pods.

Calyx 5-cleft, somewhat 2-lipped. Standard large, cordate. Keel falcate, acuminate. Filaments all united with the sheath often cleft above. Legume inflated, oblong, many-seeded.—*Herbs or shrubs, with often simple leaves, and racemed yellow flowers.*

C. sagitalis, L. *Arrow-leaved Rattle-box.*

Hairy; *stem* erect, branched; *leaves* simple, oblong-lanceolate, scarcely petioled; *stipules* united and decurrent on the stem, inversely arrow-shaped; *peduncles* few-flowered; *corolla* as long as the calyx.

Sandy soils. July. August. Ann. *Stem* 4 to 10 inches high, with spreading branches. *Leaves* alternate, hairy on both sides, rounded at the base. *Flowers* yellow. *Seeds* few, rattling in the turgid pods.

25. LUPINUS. Tourn. Lupine.

Lat. *lupus*, a wolf, because these plants were thought to devour the fertility of the soil.

Calyx deeply 2-lipped. *Sides* of the *standard* reflexed: keel scythe-shaped, pointed. Sheath of the monadelphous stamens entire; *anthers* alternately oblong and globose. Legumes coriaceous, oblong, flattened, often torulose.—*Herbs with palmately* 5—15-*foliate leaves and showy flowers in terminal racemes or spikes.*

1. L. perennis. L. *Wild Lupine.*

Somewhat hairy; *stem* erect; *leaflets* 7—11, narrowly obovate-oblong, mucronate; *flowers* alternate, in a long and loose terminal raceme; *calyx* without appendages, upper lip emarginate, lower entire; *legume* linear-oblong, very hairy.

Sandy woods and hills: common. May, June. Per. A beautiful plant, sometimes cultivated in gardens. *Stem* a foot high, soft, smoothish. *Leaves* soft, downy, on long stalks. *Flowers* purplish blue, varying to white. It is often called *Sun-dial*, from the circumstance of its leaves turning to face the sun from morning till night.

Several handsome species are sometimes cultivated in gardens, among which is L. *polyphyllus*, from Oregon, a splendid plant 3—5 feet high, with racemes of white purple or yellow flowers more than a foot long. L. *Nootkatensis*, from Nootka Sound, a handsome species 2—3 feet high, flowers purple. L. *arboreus*, a magnificent exotic shrub, 6 feet high, with large yellow flowers.

Tribe 5. SOPHOREÆ. *The Sophora Tribe.*

Stamens distinct: Corolla truly papilionaceous.

26. BAPTISIA. Vent. False Indigo.

Gr. *bapto*, to dye; in allusion to the coloring properties of some of the species.

Calyx 4 to 5-toothed bilabiate. Petals 5, nearly equal. Standard with the sides reflexed. Wings oblong. Keel slightly incurved. Stamens deciduous. Legume stalked in the persistent calyx, roundish or oblong, inflated, pointed, several seeded.—*Perennial herbs, with palmately 3-foliate* (rarely simple) *leaves, which generally blacken in drying, and racemed flowers.*

1. B. TINCTORIA, R. Brown. *Wild Indigo.*

Smooth; *stem* branching; *leaves* palmately 3-foliate, almost sessile; *leaflets* rounded wedge-obovate, acute at base, very obtuse, sometimes margined at apex, *stipules* setaceous; *racemes* few-flowered terminating the numerous branches.

Sandy woods and gravelly hills; common. Aug. *Plant* 2 to 3 feet high, bushy, slender. *Leaves* bluish-green. *Flowers* yellow, 6 to 12 or more on each raceme. *Corolla* ½ inch long. *Legume* about as large as a pea, on a long stipe, mostly 1-seeded.

2. B. AUSTRALIS, Brown. *Blue-flowered False Indigo.*

Smooth, tall and stout; *leaves* ternate on short petioles, the upper ones nearly sessile; *leaflets* oblong-wedge-form, obtuse; *stipules* lance-linear as long the petioles, rather persistent; *raceme* elongated, many-flowered, erect.

Banks of streams. Near Easton, Pa. *Beck.* Sometimes cultivated. June, July. *Stem* 2 to 3 feet high, branched. *Leaflets* 1¾ to 3 inches long, ¾ to 1 inch wide, sometimes acute. *Stipules* ½ to 1 inch long. *Racemes* 2 to 3 inches long, oval-oblong, on a stipe about as long as the calyx.

27. CERCIS. Linn. RED-BUD. JUDAS-TREE.

Gr. *kerkis*, a weaver's shuttle; alluding to the form of the legume.

CALYX 5-toothed, gibbous at base. PETALS 5, with claws sub-papilionaceous, all distinct. WINGS larger than the standard. STAMENS 10, distinct, rather unequal. LEGUME oblong, flat, many-seeded, the upper suture with a winged margin.—*Trees with simple rounded heart-shaped leaves, deciduous stipules, and rose-colored flowers in little umbel-like clusters along the branches, appearing before the leaves.*

1. C. CANADENSIS, L. *Red-bud.*

Leaves roundish-cordate, acuminate, villous in the axils of the nerves; *legume* on short foot-stalks.

Banks of streams, Southern part of the State. March—May. A handsome tree 20 to 30 feet high, often cultivated. *Leaves* 3 to 4 inches by 4 to 5 entire smooth 7-veined, on petioles 1 to 2 inches long. *Flowers* appearing before the leaves, usually in abundance, in small lateral clusters. *Corolla* bright purple. *Legume* about 3 inches long, acute at each end.

SUB-ORDER II. CÆSALPINEÆ.

TRIBE 6. CASSIEÆ. *The Senna Tribe.*

Stamens distinct, some of them often imperfect: corolla open, irregular or almost regular.

28. CASSIA. Linn. SENNA.

SEPALS 5, scarcely united. PETALS 5, unequal. STA-

MENS 5 to 10, free, unequal, spreading, 3 lower ones longest; 4 middle ones short and straight; 3 upper ones usually abortive. ANTHERS opening at the apex. LEGUME terete or compressed, many-seeded.—*Trees, shrubs or herbs* (herbs in the United States) *with simply abrupt-pinnate leaves and mostly yellow flowers.*

1. C. MARILANDICA, L. *Wild Senna.*

Stem erect; *leaflets* 6 to 9 pairs, ovate-oblong, mucronate, equal; *petiole* with a club-shaped gland near the base; *stipules* deciduous; *flowers* crowded in short axillary racemes, panicled at the summit of the branches.

Alluvial soils, along streams; common. July, Aug. Per. *Stem* 3 to 4 feet high, smooth or slightly pubescent. *Leaflets* 1 to 2 inches long, ⅓ to ¾ wide. *Racemes* in the upper axils, forming a leafy panicle. *Petals* bright-yellow, 3 erect and 2 declined. *Legume* compressed, linear, hisped, at length smooth. Medicinal.

2. C. CHÆMACRISTA, L. *Partridge Pea.*

Stem erect or decumbent; *leaflets* in 10 to 15 pairs, linear-oblong, oblique at base, obtuse, mucronate; *gland* on the petiole cup-shaped; *flowers* on slender pedicels, fascicled above the axils of the leaves.

Sandy places. June—Aug. Annual. *Stem* a foot or more high, spreading, round, pubescent. *Leaflets* crowded, ⅓ to ⅔ inch long, smooth, sub-sessile. *Flowers* large, 2, 3 or 4 in each fascicle. *Petals* bright-yellow, the 2 upper ones with a purple spot. *Stamens* 10, elongated, unequal, 4 of them yellow, the others purple.

3. C. NICTITANS, L. *Wild Sensitive Plant.*

Stem erect or decumbent, branched; *leaflets* 10 to 20 pairs, oblong-linear, obtuse, mucronate; *gland* on the petiole cup-shaped, on a slender foot-stalk; *racemes* lateral above the axils of the leaves, short, few-flowered; *stamens* 5, nearly equal; *style* very short; *legume* pubescent.

Sandy banks of streams. June—Aug. Ann. *Stem* 8 to 12 inches high, slender, a little branching. *Leaflets* crowded, ⅓ to ½ inch long. *Flowers* very small, pale-yellow, on short pedicels. The leaves are somewhat sensitive like the Mimosa, closing by night and when touched.

29. GLEDITSCHIA. Linn. HONEY LOCUST.

In honor of Gleditsch, a German botanist of the last century.

FLOWERS polygamous. CALYX of 3—5 spreading sepals, united at the base. PETALS as many as the sepals, and equaling them, the 2 lower somewhat united. STAMENS 4—5, distinct, inserted with the petals on the base of the calyx. LEGUME flat 1-many-seeded. SEEDS oval, flat.—*Trees, with supra-axillary branched spines abruptly once on twice-pinnate leaves and inconspicuous green flowers.*

G. TRIACANTHES. L. *Honey Locust.*

Thorns stout, usually triple or compound; *leaflets* lanceolate-oblong or linear-oblong, somewhat serrate; *legume* much elongated, compressed flat, often twisted, many-seeded.

Rich woods; cultivated. July. A handsome tree 30—50 feet high, with spines on its branches 2—3 inches long. *Foliage* bright and elegant. *Leaflets* about 18, 1—1½ inches long, ⅓ as wide, several of them usually transformed partly or wholly into smaller *leaflets.* *Flowers* small, white, succeeded by flat, crooked, hanging pods, 12—18 inches long, which appear in autumn like large apple-parings pendant from the branches.

The GYMNOCLADUS CANADENSIS, *Kentucky Coffee-tree,* is occasionally met with in cultivation, but is probably not native in our State.

ORDER 39. **ROSACEÆ.**—*The Rose Family.*

Trees, shrubs or herbs with alternate leaves with stipules; regular flowers with numerous (rarely few) *distinct stamens, inserted on the calyx, and* 1—*many pistils.* SEPALS 5, (rarely 3—4—8) united at the base, often appearing double by a row of bractlets outside. PETALS 5, regular, rarely wanting, inserted with the stamens on the edge of a disk that lines the calyx tube. OVARIES superior, 1 or several, distinct, 1-celled often cohering to the sides of the calyx and each other. STYLES distinct or united. *Fruit* a drupe, pome, acheuia, or follicle. This important family comprises three principal sub-orders.

SUB-ORDER I. AMYGDALEÆ. ALMOND FAMILY.

CALYX entirely free from the solitary ovary, deciduous. STYLE terminal. Fruit a drupe (stone fruit.)—*Trees or shrubs, with simple leaves, the bark exuding gum, and the bark, leaves and kernels yielding the peculiar flavor of prussic acid.*

PRUNUS. Tourn. PLUM.

CALYX 5-cleft, regular, deciduous. PETALS 5 spreading. STAMENS 15—30. OVARY with 2 pendulous ovules. DRUPE oval or oblong, fleshy, smooth, usually covered with a glaucous bloom; the stone smooth, sharp-edged and pointed, and the margins mostly grooved.—*Small trees or shrubs with serrate leaves, rolled up in the bud, and white flowers, usually preceding the leaves from lateral buds, the pedicels in simple umbel-like clusters.*

1. P. AMERICANA. Marsh. *Wild Yellow Plum. Red Plum.*

Leaves ovate or obovate, acuminate, sharply and often doubly serrate, very veiny, smooth when mature; *umbels* 2—5 flowered, *drupe* roundish-oval, nearly destitute of bloom.

River banks, and along hedges:-common. *Flowers* in May. *Fruit* in Aug. A small tree 10—15 feet high, much branched and thorny. *Leaves* 2—3 inches long, ⅔ as wide. *Petioles* ¼—½ inch long, mostly with 2 glands near the summit. *Flowers* white, preceding the leaves. *Fruit* ¾—1 inch in diameter, yellow or orange often tinged with red, with a yellow pulp and thick, tough skin, pleasant tasted.

2. P. SPINOSA, L. *Sloe. Black Thorn.*

Branches thorny; *leaves* obovate-elliptical, downy beneath, sharply doubly-toothed; *peduncles* solitary; *calyx* companulate; *drupe* globose.

Hedgerows and cultivated grounds. Introduced. A thorny shrub 12 to 15 feet high, native of Europe. Sparingly naturalized.

3. P. DOMESTICA, L. *Common Garden Plum.*

Branches unarmed; *leaves* oval-lanceolate, acute; *pedicels* nearly solitary; *drupe* globose, oval, ovoid and obovoid. This long cultivated tree or shrub is said to be a native of Italy. It rarely exceeds 15 feet in height. *Fruit* black, varying through many colors to white, covered with a rich glaucous bloom, ripe in Aug. *Varieties* very numerous.

4. P. CHICASA, Michx. *Chickasaw Plum.*

Branches spinose; *leaves* oblong-lanceolate, glandular serrulate, acute, nearly smooth; *umbels* 2 to 3-flowered; *pedicels* short, smooth; *drupe* globose. A fine fruit-shrub, native of Arkansas, often cultivated. Height 8 to 12 feet. *Leaves* 1 to 2 inches long, ½ as wide. *Flowers* small, white, expanding with the leaves. *Fruit* red or yellowish-red, tender and succulent, ripe in July.

ARMENIACA, *a genus very closely resembling Prunus.*

A. VULGARIS. *Common Apricot.* A tree 10 to 15 feet high, from Armenia. *Flowers* white, preceding the leaves. *Fruit* 1 to 2 inches in diameter, purplish-yellow. Cultivated.

A. DASYCARPA. *Black Apricot.* A tree about the size of the last, from Siberia. *Flowers* white, preceding the leaves. *Fruit* dark-purple, when mature.

2. CERASUS. Tourn., Juss. CHERRY.

Cerasus, a town in Pontus from where the garden cherry was first brought.

FLOWERS, &c., as in *Prunus.* DRUPE globular, without a bloom; the *stone* almost globular, smooth.—*Trees or shrubs with the leaves folded in the bud, and white flowers in umbels or racemes.*

* *Flowers in racemes at the end of leafy branches.*

1. C. VIRGINIANA, DC. *Choke Cherry. Wild Cherry.*

Leaves broad, oval or obovate, abruptly acuminate, often sub-cordate, sharply (often doubly) serrate with slender teeth, thin, smoothish; *petioles* with 2 to 4 glands; *racemes* short and close, erect or spreading; *petals* obovate; *fruit* subglobose.

River banks and woods; common. Fl. May. Fr. Aug. A tall overhanging shrub or small tree, with greyish bark. *Leaves* 2 to 3 inches long, ½ as wide, with a short abrupt acumination. *Flowers* white. *Fruit* (cherries) abundant, of a dark red color, very austere and astringent to the taste.

2. C. SEROTINA, DC. *Wild Black Cherry.*

Leaves oval-oblong or lance-oblong, acuminate, smooth and shining above, finely serrate, bearded along the midrib beneath; *petiole* mostly with 2 or more glands; *racemes* elongated; *petals* obovate; *drupe* globose.

Woods; common. Fl. May, June. Fr. Aug., Sept. A fine large tree, 50 to 80 feet high of uniform size and undivided to the height of 20 to 30 feet, 2 to 4 feet in diameter. *Bark* of the trunk black and rough, that of the branches reddish-brown. *Leaves* 3 to 5 inches long, ½ as wide, with 1 to 2 pairs of reddish glands at base. *Flowers* white, in long racemes or clusters, which are at length pendulous. *Fruit* nearly black when mature, slightly bitter. The wood is close-grained and very valuable for cabinet work.

* * *Flowers sub-umbellate or solitary.*

3. C. PENNSYLVANICA, DC. *Bird Cherry.*

Leaves oval or oblong-lanceolate, acuminate, finely and sharply serrate, shining, green and smooth on both sides, mostly with 2 glands at the base; *flowers* many in a cluster, on long pedicels; *fruit* globose.

Rocky woods and thickets. Fl. May. Fr. Aug. A small tree 20 to 30 feet high, with light red-brown bark. *Leaves* 2 to 5 inches long. ½ as wide. *Flowers* white, on slender pedicels 2½ inches long, collected into a sort of umbel. *Fruit* small, red, thin, and sour flesh.

4. C. PUMILA, Michx. *Dwarf Cherry. Sand Cherry.*

Smooth, depressed and trailing; *leaves* obovate-lanceolate, acute or obtuse, serrulate, smooth, glaucous beneath; *umbels* sessile, few-flowered; *drupe* ovoid.

Gravelly soils. May. A small trailing shrub, with ascending branches 1 to 2 feet high. *Flowers* white, 3 to 5 in each umbel; *pedicels* smooth, 1 inch long. *Fruit* small, dark-red, acid, agreeable to the taste.

CULTIVATED EXOTIC SPECIES.

5. C. VULGARIS, Mill. *Red or Sour Cherry.*

Branches spreading; *leaves* ovate, lanceolate or obovate, acute at apex, mostly narrowed at base, smoothish; *umbels* sub-sessile; *flowers* rather preceding the leaves; *fruit* globose; *pedicels* rather short. A tree 12 to 20 feet high, with a roundish compact head. *Flowers* white, 2 to 3 from each bud appearing in April. *Fruit* large, various shades of red and brown, acid or sub-acid ½ to ⅔ inch in diameter. There are about 50 varieties of this species cultivated in the United States.

6. C. AVIUM, Mœnch. *English Cherry. Black Cherry. Sweet Cherry. Bleeding-heart. Ox-heart. Duke Cherry.*

Branches erect or ascending; *leaves* oblong or obovate, acuminate, doubly and rather coarsely serrate-dentate, smooth above, pilose beneath; *umbels* sessile; *flowers* scarcely preceding the leaves; *fruit* roundish-ovoid, or sub-cordate at base; *pedicels* drooping. A common cultivated tree 20 to 50 feet high with an oblong or pyramidal head. *Leaves* 3 to 6 inches long, ½ as wide, on petioles 1 to 2 inches long, often with 2 glands. *Flowers* white. *Fruit* various shades of red, black or mottled, firm and fleshy, generally sweet. Varieties numerous.

3. PERSICA. Tourn. PEACH. NECTARINE.

Named from *Persia* its native country.

CALYX 5-cleft, tubular, deciduous. PETALS 5. DRUPE fleshy, tomentose or smooth. STONE somewhat compressed, ovate, acute, rugosely furrowed and perforated on the surface.—*Small trees. Leaves conduplicate in æstivation.*

1. P. VULGARIS, Mill. *Common Peach.*

Leaves lanceolate, serrate, with all the serratures acute; *flowers* solitary, subsessile, preceding the leaves; *drupe* tomentose. A common cultivated tree or shrub 8 to 15 feet high. *Leaves* 3 to 5 inches long, ⅓ as wide, smooth; *petioles* short with 1 or 2 glands. *Flowers* rose-color. *Fruit* large, 1 to 2½ inches in diameter, yellowish, tinged with purple, densely tomentose. Numerous varieties of this delicious fruit are now cultivated in the United States.

2. P. LÆVIS. *Nectarine.*

A tree closely resembling the peach in form, foliage and flowers. The fruit is 1 to 3 inches in diameter, smooth, yellow, purple, red, &c. Native of Persia.

4. AMYGDALUS. Willd. ALMOND.

Specific character as in Persica, except the fruit, which is not fleshy; compressed. Stone perforate and furrowed, ovate, compressed, one edge acute, the other broad, obtuse.

1. A. COMMUNIS, Willd. *Common Almond.*

Leaves lanceolate, serrate, with the lower serratures glandular; *flowers* in pairs, sessile, appearing before the leaves. Native of Barbary. Scarcely cultivated in this country, 10 to 20 feet high.

2. A. PUMILA, *Dwarf double-flowering Almond.*

Leaves lanceolate, doubly-serrate; *flowers* in pedicels. A low branching shrub, 2 to 3 feet high. Native of China. Highly ornamental, common in cultivation. *Flowers* very double, pale rose-color, very numerous, clothing the whole shrub in their roseate hue while the leaves are yet small. May, June.

SUB-ORDER II. ROSACEÆ PROPER.

CALYX free from the ovaries, but sometimes enclosing them in its tube. PISTILS few to many, (sometimes single); *fruit* achenia or follicular.

TRIBE 1. SPIRAEÆ. *The Meadow-sweet Tribe.*

5. SPIRÆA. Linn. MEADOW-SWEET.

CALYX 5-cleft, persistent. PETALS 5, roundish, equal. STAMENS 10 to 50 exserted. CARPELS 3 to 12, distinct, rarely united at base, follicular, sessile, rarely stiped. SEEDS 2 to 15.—*Unarmed perennial shrubs or herbs, with alternate leaves and branches, and white or rose-colored flowers; rarely diœcious; never yellow.*

* *Shrubby; leaves lobed and toothed.*

1. S. OPULIFOLIA, L. *Nine-bark.*

Nearly smooth; *leaves* roundish, somewhat 3-lobed and cordate, doubly-toothed and crenate, petioled; *corymb* umbel-like; *pedicels* filiform; *carpels* 3 to 5, at length spreading.

Rocky river banks and along streams; common. June. A shrub 4 to 10 feet high, much branched. *Leaves* 1 to 2½ inches long, nearly as wide, sometimes cordate at base with 3 obtuse lobes above. *Corymbs* resembling simple umbels, hemispherical, 1 to 2 inches in diameter. *Flowers* white, often tinged with purple. *Follicles* diverging smooth, purplish, 2-seeded.

* * *Shrubby; leaves entire or toothed.* SPIRÆA PROPER.

2. S. CORYMBOSA, Raf. *Meadow-sweet.*

Nearly smooth; *leaves* oval or ovate, on short petioles, whitish beneath, incisely serrate towards the apex; *corymbs* large and flat, several times compound, terminal; *carpels* 3 to 5-seeded.

Alleghenies; rare. June. *Stem* 1 to 2 feet high, slightly pubescent, reddish. *Leaves* 2 to 3 inches long, ¾ to 1¼ wide, nearly smooth above, entire towards the base. *Flowers* very numerous, white or rose-colored, in a corymb 4 to 6 inches broad.

3. S. SALICIFOLIO, L. *Meadow-sweet.*

Nearly smooth; *leaves* wedge-lanceolate, simply or doubly serrate; *racemes* in dense terminal-compound panicles; *carpels* 5, distinct, smooth.

Meadows along streams; common. June, July. A small bushy shrub 2 to 5 feet high, with purple and brittle branches. *Leaves* varying in form, mostly acute, but sometimes obtuse, 1½ to 3 inches long, ⅓ to ½ inch wide. *Flowers* numerous, white, often tinged with red, small, with conspicuous stamens.

4. S. TOMENTOSA, L. *Hard-hack Steeple-bush.*

Stem and peduncles reddish-tomentose; *leaves* ovate-lanceolate, unequally serrate, densely tomentose beneath; *racemes* terminal, compound, crowded; *carpels* 5, woolly.

Low grounds and meadows; common. July, Aug. A small shrub 2 to 3 feet high. *Stems* very hard, brittle. *Leaves* 1½ to 2 inches long, ½ as wide, dark green above, rusty white beneath. *Flowers* very numerous, small, light-purple, with conspicuous stamens forming handsome pyramidal clusters.

* * *Herbaceous perennials.*

5. S. LOBATA, Murr. *Queen of the Prairie.*

Leaves interruptedly pinnate, the terminal *leaflets* very large 7 to 9-parted, the lobes incised and toothed; *lateral leaflets* 3-lobed, the lobes all serrate, mostly incised or toothed; *flowers* in a compound clustered panicle; *sepals* reflexed.

Moist grounds. June, July. A beautiful herb 4 to 8 feet high. *Stem* angled. *Flowers* large, deep rose-color, numerous, and very delicate, in panicled compound clusters, on a long naked peduncle. *Carpels* 6 to 8, smooth.

CULTIVATED EXOTIC SPECIES.

6. S. ULMARIA. *Double Meadow-sweet.*

Leaves 3 to 7-foliate, with minute leaflets interposed; *lateral leaflets* ovate-lanceolate; *terminal ones* much larger, palmately 5 to 7-lobed, all doubly serrate, and whitish tomentose beneath; *stipules* reniform, serrate; *panicle* corymbose, long-pedunculate. Native of Europe; cultivated in gardens. *Flowers* numerous, white, mostly very double, appearing in July.

7. S. FILAPENDULA. *Pride of the West.*

Leaves interruptedly pinnate; *leaflets* 9 to 12, pinnatifidly serrate, with many minute ones interposed; *stipules* large, semi-cordate, serrate; *corymb* on a long terminal peduncle. Native of Europe. A handsome delicate herb 1 to 3 feet high with white flowers ⅓ to ½ inch in diameter. Cultivated in gardens.

6. GILLENIA. Mœnch.

CALYX tubular, bell-shaped, constricted at the throat, 5-cleft; TEETH erect. PETALS 5, linear-lanceolate, somewhat unequal, elongated in the throat of the calyx. STAMENS 10 to 20, mostly included. STYLES 5, filiform, terminal. CARPELS 5, distinct, 2-valved, 2 to 4-seeded, included in the calyx.—*Perennial herbs with almost sessile 3-foliate leaves, doubly serrate and incised, and pale rose-colóred or white flowers in paniculate corymbs.*

1. G. TRIFOLIATA, Mœnch. *Indian Physic.*

Leaves ternate; *leaflets* lanceolate or ovate-oblong, pointed irregularly cut-serrate; *stipules* small, awl-shaped, entire.

Rich shady woods; common. June. A handsome plant 2 to 3 feet high, slender and nearly smooth. *Lower leaves* petiolate; *leaflets* 2 to 4 inches long, ⅓ as wide, pubescent beneath, sub-sessile. *Flowers* axillary and terminal, few, nearly white. Medicinal.

2. STIPULACEA, Nutt. *American Ipecac.*

Radical leaves pinnatifid; those of the *stem* alternate; *leaflets* serrate, deeply incised; *stipules* large and leaf-like, doubly incised and clasping.

Western part of the State. June. *Stem* 2 to 3 feet high, branching. Readily distinguished from the former by the large clasping stipules. *Flowers* few, rose-colored. Medicinal.

TRIBE 2. DRYADEÆ. *The Bramble Tribe.*

Pistils mostly numerous, forming seed-like achenia or little drupes in fruit.

7. AGRIMONIA. Tourn. AGRIMONY.

CALYX 5-cleft; *tube* top-shaped, contracted at the throat, armed with hooked bristles above, indurated and enclosing the fruit; *limb* 5-cleft, closed after flowering. PETALS 5. STAMENS 12 to 15, inserted with the petals upon the calyx. ACHENIA 2, invested by the hardened calyx. STYLES terminal.—*Perennial herbs, with interruptedly pinnate leaves and yellow flowers in slender-spiked racemes; bracts 3-cleft.*

1. A. EUPATORIA, L. *Common Agrimony.*

Stem and stalks hairy; *leaflets* oblong-ovate, crenate dentate, the terminal one petioled: *spike* long and slender, terminal, many-flowered; *petals* twice the length of the calyx: *fruit* distant, top-shaped, hisped, smooth at base.

Borders of woods and hedges; common. July—Sept. *Stem* 1 to 3 feet high, branching. leafy. *Leaflets* 3—5—7, with small ones interposed, nearly smooth. *Racemes* 6 to 12 inches long, spicate. *Flowers* yellow, about ⅓ inch in diameter on very short pedicels. *Calyx* tube fluted with 10 ribs, and surrounded with reddish hooked bristles.

2. A. PARVIFLORA, Ait. *Small-flowered Agrimony.*

Stem and stalks bristly with brownish spreading hairs. *Leaflets* numerous, linear-lanceolate, incisely serrate, crowded, 11 to 19, with smaller ones intermixed; *spikes* long and slender; *petals* small.

Woods and dry meadows. July, Aug. *Stem* 3 to 4 feet high. *Leaflets* 2 to 3 inches by ¼ to ½. *Flowers* pale yellow, numerous, in long slender racemes. *Fruit* roundish divaricately hispid.

8. SANGUISORBA. Linn. GREAT BURNET.

Lat. *sanguis*, blood, *sorbeo*, to absorb, the plants having been esteemed as vulneraries.

FLOWERS perfect or rarely polygamous. CALYX 4-cleft with 2 to 3 scales or bracts at base externally. PETALS none. STAMENS 4, the filaments usually enlarged upwards opposite the calx segments. ACHENIUM dry, included in the hardened 4-winged calyx-tube.—*Perennial* (rarely annual) *herbs, with unequally pinnate leaves and small flowers in close spiked heads.*

1. S. CANADENSIS, L. *Burnet Saxifiage.*

Smooth; *leaves* pinnate; *leaflets* ovate-oblong, sub-cordate, serrate; *spikes* cylindric, long; *stamens* longer than the corolla.

Wet meadows. Aug., Sept. *Stem* 2 to 4 feet high, smooth, striate, sparingly branched. *Stipules* leafy, serrate. *Flowers* white, in crowded spikes, which are from 2 to 5 inches long, terminating the long naked branches. *Calyx* greenish-white, resembling a corolla.

9. POTERIUM. Linn.

Lat. *poterium*, a drinking vessel.

FLOWERS monœcious. CALYX-TUBE contracted at the mouth, 3-bracteate, limb 4-parted. PETALS none. STAMENS 20 to 30. OVARIES 2; *style* filiform. ACHENIA dry, included in the calyx.—*Herbs with unequally pinnate leaves.*

P. SANGUISORBA, L. *Burnet.*

Smooth; *stem* unarmed, angular; *leaflets* 7 to 11, ovate or roundish, deeply serrate; *spike* or *heads* sub-globose, the lower flowers staminate. Per. Occasionally cultivated, and at one time held in high repute for its supposed medicinal properties.

10. GEUM. Linn. AVENS.

Gr. *geuo*, to give an agreeable odor; some of the roots being aromatic.

CALYX bell-shaped or concave, deeply 5-cleft, usually with 5 small bractlets alternating with the segments. PETALS 5. STAMENS numerous, inserted with the disk that lines the base of the calyx. ACHENIA numerous, hooked on a conical or cylindric dry receptacle, the long persistent styles forming hairy or jointed tails.—*Perennial herbs, with pinnate or lyrate leaves.*

1. G. VIRGINIANUM, L. *White Avens.*

Stem rather hairy below; *radical leaves* pinnate, lyrate, or rarely simple and rounded; those of the stem 3 to 5-lobed or divided, all unequally and incisely dentate, softly pubescent; *stipules* obovate, entire or incised; *petals* wedge-obovate scarcely as long as the calyx.

Woods and meadows; common. June, July. *Stem* simple or branched. *Leaves* very variable in form; *lower ones* often 3-foliate, with appendaged petioles 6 to 8 inches long. Upper leaves simple, acute, sessile. *Flowers* rather small, white or pale yellow on peduncles 1 to 3 inches long terminating the branches, at first somewhat nodding, at length erect.

2. G. RIVALE, L. *Water Avens. Purple Avens.*

Pubescent; stem sub-simple; *radical leaves* lyrate and interruptedly pinnate, those of stem ternate or 3-lobed all crenate dentate; *petals* inversely heart-shaped, contracted into a claw, about as long the calyx; carpels in a stiped head, very hairy. Moist places: May, June. *Stem* 1 to 2 feet high nearly simple. *Root leaves* 4 to 6 inches long on very long petioles. *Stem leaves* 1 to 3 inches long nearly white. *Flowers* large, purple, nodding, terminating the few erect branches. *Calyx* purplish brown. *Feathery* fruiting heads upright. *Root* aromatic and astringent.

11. WALDSTEINIA. Willd.

In honor of *Francis von Waldstein*, a German botanist.

CALYX-TUBE inversely conical; the limb 5-cleft, with 5 alternate often minute and deciduous bractlets. PETALS 5 to 10. STAMENS many, inserted into the throat of the calyx. STYLES 5 to 8, long, deciduous. ACHENIA 2 to 6, minutely hairy. SEED erect.—*Low perennial herbs, with* 3 *to 5-lobed or divided, leaves and small yellow flowers on bracted scapes.*

W. FRAGARIOIDES, Traut. *Dry Strawberry.*

Low; *leaflets* 3, broadly wedge-form, crenately cut, toothed, ciliate; *scapes* several-flowered bracted; *petals* longer than the calyx; *carpels* hairy.

Hilly woods. May. *Root* creeping. A handsome plant with scapes 3 to 6 inches high. Leaves on petioles 3 to 6 inches long. *Leaflets* 1 to 2 inches in diameter, nearly sessile, apex rounded and cut into lobes and teeth, dark, shining green above. *Flowers* yellow ½ inch broad.

12. DALIBARDA, Linn.

In honor of *Dalibard*, a French botanist of the last century.

CALYX inferior deeply 5 to 6 parted, 3 of the divisions larger and toothed. PETALS 5, sessile, deciduous. STAMENS numerous. STYLES 5 to 8, long deciduous. ACHENIA five, dry, adhering to the calyx.—*Low perennials, with creeping and tufted stems, roundish heart-shaped leaves on slender petioles and* 1 *to* 2 *white flowers on scape-like peduncles.*

D. REPENS, L. *False Violet.*

Depressed, in tufts; *leaves* simple, roundish-cordate, crenate; *stipules* linear-setaceous; *calyx* spreading in flower, erect in fruit.

Moist shady places. June—Aug. *Stem* herbaceous, creeping and rooting, 2 to 12 inches long. *Leaves* 1 to 2 inches in diameter, villose-pubescent on petioles 1 to 3 inches long. *Flowers* white on long nearly radical peduncles. *Petals* obovate, longer than the sepals.

13. RUBUS. Linn. BRAMBLE.

Celtic *rub*, red, the color of the fruit of some species.

CALYX 5-parted, spreading. PETALS 5, deciduous. STAMENS numerous, inserted into the border of the stick. STYLE nearly terminal. FRUIT composed of many pulpy carpels aggregated on a spongy receptacle, persistent or deciduous.—*Perennial half shrubby plants, with usually biennial stems armed with prickles, white* (rarely reddish) *flowers, and edible fruit.*

Fruit concave beneath, separating from the dry, conical, persistent receptacle. Raspberries.

* *Leaves simple; flowers large reddish; prickles none.*

1. R. ODORATUS, L. *Rose-flowering Raspberry.*

Hisped with glandular hairs; *stem* erect, branched; *leaves* large 3 to 5 lobed, the lobes acute or acuminate, unequally serrate; *peduncles* many-flowered, compound; *calyx*-lobes tipped with a narrow appendage as long as themselves; *petals* rounded.

Rocky places; common. June—Aug. *Stem* 4 feet high with the stalks, branches and calyx bristly with glandular clammy hairs. *Leaves* 4 to 8 inches long, nearly as wide, cordate at base. *Flowers* large, purple, resembling a rose. *Stamens* very numerous, 1 to 200, whitish. *Fruit* broad and flat, bright red, sweet when ripe.

* * *Leaves 3 to 7-foliate.*

2. R. TRIFLORUS, Rich. *Dwarf Raspberry.*

Stems ascending or trailing; *leaves* ternate or pedate-quinate, on slender petioles; *leaflets* rhombic-ovate or lance-ovate, acute at both ends, coarsely doubly serrate, terminal one petiolate, thin; *peduncle* terminal 1 to 3 flowered; *sepals* lanceolate.

Moist woods and hills. June. *Stem* flexuous, smooth, reddish. *Leaflets* 1 to 2 inches long, ½ to 1 wide. *Petioles* 1 to 2 inches long. *Petals* white, rather longer than the reflexed sepals. *Fruit* small, dark red, usually sour, ripe in August.

3. R. STRIGOSUS, Michx. *Wild Red Raspberry.*

Stem erect, shrubby, strongly hisped; *leaves* ternate or quinate; *leaflets* oblong-ovate, pointed, cut-serrate white tomentose beneath, the terminal one of ten subcordate; *peduncles* 4 to 6 flowered.

Rocky places, common in mountainous regions. May. *Stem* reddish-brown, 2 to 3 feet high, covered with strong bristles. *Leaflets* 1½ to 2 inches long, ½ to ⅔ as wide, terminal one distinctly petiolate. *Flowers* white. *Sepals* spreading, nearly as long as the petals. *Corolla* cup-shaped. *Fruit* hemispherical, light red, rich flavored, ripe in June—Aug.

4. R. OCCIDENTALIS, L. *Black Raspberry.*

Shrubby, glaucous, armed with recurved prickles; *leaves* pinnately 3-foliate; *leaflets* ovate, pointed, coarsely doubly serrate, whitened downy underneath; *flowers* axillary and terminal.

Thickets and fields along fences; common. May. *Stem* 4 to 8 feet long, sparingly branched. *Leaflets* 2 to 3 inches long, ½ to ⅓ as wide, on long round petioles. *Flowers* white, 1 to 3 on axillary peduncles, in terminal leafy racemes. *Fruit* roundish, nearly black, sweet, and well flavored, ripe in July.

5. R. IDÆUS, L. *Garden Raspberry.*

Hisped or armed with recurved prickles; *leaves* pinnately 3 to 5 foliate; *leaflets* broad-ovate or rhomboidal, pointed, unequally and incisely serrate, hoary tomentose beneath, sessile; *flowers* in panicled corymbs. *Stem* shrubby, 3 to 5 feet high. *Leaflets* smoothish above, 2 to 4 inches long, ⅔ as wide. *Petals* white, entire, shorter than the hoary tomentose calyx. *Fruit* red, amber color or white, ripe in June and July. Many varieties of this plant are cultivated for the delicious fruit.

BLACKBERRIES. *Fruit inseparable from the juicy, deciduous receptacle.*

6. R. VILLOSUS, Ait. *High Blackberry.*

Prickly; *stem* angular, and with the branches, peduncles and lower surface of the leaves hairy and glandular; *leaves* ternate and pedate-quinate; *leaflets* ovate, pointed, unequelly serrate, the terminal one somewhat cordate, conspicuously stalked; *flowers* in elongated terminal racemes; *sepals* acuminate, much shorter than the obovate spreading petals.

Var. *frondosus*, Torr.: smoother and much less glandular; *flowers* lower corymbose with leafy bracts.

Fields and borders of thickets; common. May, June. *Stem* erect or declined, 4 to 8 feet high. *Flowers* white, numerous. *Fruit* ovoid-oblong, ½ to 1 inch long, purple or nearly black when ripe, sweet and well flavored. Aug., Sept.

7. R. CANADENSIS, L. *Low Blackberry. Dewberry.*

Stem procumbent or trailing, somewhat prickly; *leaves* ternate or pedately 5 to 7-parted; *leaflets* oval or lance-oval, mostly pointed, thin, nearly smooth, sharply and unequally cut serrate, the terminal on petioles and sub-cordate; *flowers* in racemes, with leaf-like bracts.

Sandy and gravelly fields; common. May, June. *Stems* ascending at base, trailing several yards on the ground. *Flowers* white, on slender pedicels. *Petals* twice as long as the calyx, obovate. *Fruit* ½ to 1 inch in diameter, black, sweet and juicy, ripe July and Aug.

8. R. HISPIDUS, L. *Running Swamp Blackberry.*

Stems long, slender, somewhat shrubby, prostrate, beset with small prickles turned backwards; *leaves* ternate or pedate, 5-foliate; *leaflets* somewhat coriaceous, obovate, obtuse, coarsely serrate, entire towards the base, smoothish; *flowers* in corymbs or racemes, without bracts; *sepals* spreading, half as long as the petals.

Swamps and wet woods; common. May, June. *Stem* profusely trailing with short erect branches. *Leaflets* 1 to 2 inches long, ½ as wide, nearly sessile, persistent through the winter on the common petiole 1 to 3 inches long. *Flowers* white. *Fruit* composed of a few large blackish grains, red or purple.

9. R. CUNEIFOLIUS, Pursh. *Sand Blackberry.*

Low shrubby armed with stout recurved prickles; *leaves* ternate and pedately 5-foliate; *leaflets* wedge-form, obovate, thickish, serrate towards the apex, pubescent tomentose beneath; *peduncles* 2 to 4-flowered.

Sandy fields and woods. May, June. *Stem* 1 to 3 feet high. *Petioles* often prickly. *Flowers* white or roseate. *Petals* 3 times as long as the tomentose oblong mucronate sepals. *Fruit* black, juicy, well-flavored, ripe in July, Aug.

10. R. TRIVIALIS, Mich. *Low Bush Blackberry.*

Procumbent with many leafy and nearly erect branches, armed with numerous recurved prickles; *leaves* mostly ternate; *leaflets* ovate or oval, unequally serrate, more or less pilose; *peduncles* 1 to 3-flowered.

Dry woods or rocky neglected fields. April, May. *Stem* 4 to 8 feet long, slender, often several from the same root running in different directions, smoothish, purple, and giving out numerous leafy flowering branches 2 to 6 inches long, nearly erect. *Flowers* terminal, white, rather large. *Petals* obovate, twice as long as the calyx. *Fruit* oblong or roundish, ½ to 1 inch in diameter, very succulent and sweet, black when ripe. July.

14. ROSA. Tourn. ROSE.

Celtic *rhos*, red; Gr. *rodon*,; Lat. *rosa*.

CALYX-TUBE urn-shaped, fleshy, contracted at the orifice; *limb* 5-parted, the segments often with a leafy appendage. PETALS 5, inserted with the numerous stamens into the edge of the calyx-tube. PISTILS numerous, nearly included, inserted over the whole inner surface of the disk. OVARIES many becoming bony achenia in fruit included in and fixed to the fleshy tube of the calyx.—*Prickly shrubs with odd-pinnate leaves, stipules cohering with the petiole, and showy, mostly red and white fragrant flowers.*

NATIVE SPECIES.

1. R. CAROLINA, L. *Swamp Rose.*

Prickles recurved, often wanting; *leaflets* 5 to 9, elliptical, often acute, sharply serrate, glaucous beneath, dull-green above; *flowers* in corymbs, rarely solitary; *lobes* of the *calyx* very long, appendaged, spreading, with the panicles glandular-bristly; *fruit* depressed-globose, somewhat bristly.

Swamps and low grounds; common. July—Sept. A handsome species 3 to 8 feet high, erect and bushy, with reddish branches sometimes unarmed. *Leaflets* 1 to 2 inches long, ½ as wide, somewhat variable in form. *Flowers* 5 to 7 in terminal corymbs. *Petals* large, crimson, inversely heart-shaped.

2. R. LUCIDA, Ehr. *Low Wild Rose.*

Armed with scattered unequal bristly prickles, mostly deciduous, the stouter persistent prickles nearly straight, slender; *leaflets* 5 to 9, lance-elliptical shining above, sharply serrate; *stipules* dilated, long, smooth; *peduncles* somewhat hisped, 1 to 3-flowered; *segments* of the *calyx* entire appendaged, spreading but not reflexed; *fruit* globose-depressed, hispid or smooth.

Dry soil or borders of swamps; common. June, July. *Shrub* 1 to 3 feet high, slender, with greenish branches. *Leaflets* 1 to 1½ inches long, half as wide, acute or obtuse, odd one petiolate. *Flowers* rather large, pale red. *Petals* inversely heart-shaped. *Fruit* small, red, mostly smooth when mature.

3. R. BLANDA, Ait. *Early Wild Rose.*

Prickles few, straight, slender, deciduous; *leaflets* 5 to 7, oval or oblong, obtuse, serrate, pale and mostly pubescent beneath; *stipules* large; *flowers* 1 to 3 on short smooth peduncles.

Dry hills and rocks; common. May, June. *Stems* 2 to 3 feet high with reddish bark, prickly near the base. *Bracts* large, downy. *Flowers* rather large, rose-color. *Petals* obcordate, longer than the sepals. *Fruit* globose, red, crowned with the persistent erect and connivent calyx lobes.

NATURALIZED SPECIES.

4. R. RUBIGINOSA, Ait. *Sweet Brier. Eglantine.*

Stem smooth, armed with numerous very strong recurved prickles; *leaflets* 5 to 7, ovate or somewhat rounded with rusty glands beneath, doubly serrate; *flowers* mostly solitary; *fruit* ovoid or obovate, and with the peduncles hisped.

Hedges and roadsides; common. June, July. A stout prickly shrub 4 to 10 feet high. *Leaflets* ½ to 1 inch long, ⅔ as wide, acute, bright green above, rusty beneath, and when rubbed over, fragrant. *Flowers* solitary or 2 or 3 together, pale red, fragrant. *Fruit* orange-red, crowned with the persistent calyx lobes. *Varieties* in cultivation about 25, single and double.

CULTIVATED EXOTIC SPECIES.

5. R. GALLICA, L. *Common French Rose.*

This is the common red rose of gardens. *Stem* and *petioles* armed with numerous fine scattered prickles. *Leaflets* mostly 5, elliptical or broad oval, thick *flowers* erect, large; *sepals* ovate. *Fruit* ovoid, and with the peduncles hisped. Numerous varieties are known in cultivation, among which are the velvet, carmine, carnation, &c.

6. R. PIMPINELLIFOLIA, Ser. *Scotch or Burnet Rose.*

A shrub 2 to 3 feet high with the stems densely covered with straight needle-shaped prickles. *Leaflets* 5 to 9, small, roundish, obtuse, smooth, simple serrate. *Flowers* small, numerous, globular, usually roseate, but changing in the numerous varieties to white, red or yellow. Native of Scotland.

7. R. EGLANTERIA, S. *Australian Eglantine. Yellow Rose.*

A bushy shrub about 3 feet high, with ash-colored stems and red branches, both armed with straight, slender, scattered prickles. *Leaflets* 5 to 7, small, broad, oval or obovate, smooth, shining above, sharply serrate. *Flowers* numerous, golden yellow, of very short duration. *Varieties* numerous, both single and double, variegated with red.

8. R. DAMASCENA, L. *Damask Rose.*

A fine species 3 to 4 feet high, branching, bushy stems, armed with unequal spines, mostly stipular or hooked. *Leaflets* large, broadly elliptical, white downy beneath. *Sepals* reflexed. *Flowers* rather numerous, of a delicate pale roseate hue, usually with numerous petals and a delicious fragrance. Among its numerous varieties is the common *monthly* rose. Native of the Levant.

9. R. CENTIFOLIA. *Hundred-leaved Rose. Provens Rose.*

A shrub 2 to 4 feet high. *Stems* covered with numerous nearly straight prickles. *Leaflets* 5 to 7, ovate glandular ciliate on the margin, sub-pilose beneath. *Sepals* spreading in flower. *Flowers* usually of a pink color, but varying in hue, form and size in the numerous varieties. Native of S. Europe.

10. R. ALBA. *White Garden Rose.*

A fine shrub 5 to 8 feet high, with slightly glaucous stems, armed with slender recurved prickles, sometimes none. *Leaflets* roundish ovate, shortly pointed. *Sepals* pinnatifid. *Petals* spreading. *Flowers* large corymbose, sweet-scented, generally pure white, sometimes tinged with blush. Native of Germany.

11. R. MULTIFLORA. *Japan Rose.*

A free growing shrub with long shoots easily trained to the height of 15 to 20 feet armed with slender] scattered prickles. *Leaflets* 5 to 7, ovate-lanceolate, soft and slightly rugose. *Flowers* corymbose, often numerous. *Sepals* short. *Styles* exserted. *Petals* white, varying through roseate to purple. Native of Japan.

12. R. INDICA. *Chinese Monthly* or *Bengal Rose.*

An erect or climbing shrub, with purplish stems, armed with strong, remote prickles. *Leaflets* 3 to 5, acuminate, thickish, shining, smooth, serrulate. *Flowers* solitary or paniculate, in the numerous varieties every hue from pure white to crimson, blooming from April to November.

13. R. SETIGERA, Michx. *Michigan Rose. Prairie Rose.*

Branches long, ascending, smooth, *spines* few, strong, stipular; *leaflets* large. 3 to 5, ovate, serrate, pubescent beneath; *stipules* narrow, pointed; *flowers* corymbose, *calyx* glandular, *segments* sub-entire; *styles* united; *fruit* globose.

This splendid species is a native of Michigan and other Western States. *Stems* hardy and of rapid growth, capable of being trained 12 to 20 feet. *Flowers* in very large clusters, changeable in hue, nearly scentless, and of short duration. About 20 varieties are cultivated.

SUB-ORDER III. POMEÆ. THE APPLE FAMILY.

Trees or shrubs with alternate simple or compound leaves.

15. CRATÆGUS. Linn. HAWTHORNS.

Gr. *kratos*, strength; in allusion to the hardness of the wood.

CALYX-TUBE urn-shaped, limb 5-cleft. PETALS 5, roundish. STAMENS many or only 10 to 15. STYLES 1 to 5, smooth. FRUIT a pome, containing 1 to 5 bony 1-seeded carpels.—*Thorny trees or shrubs, with simple mostly lobed leaves, subulate deciduous bracts, and showy white* (rarely rose-color) *flowers in corymbs.*

* *Leaves serrate sub-entire, not lobed.*

1. C. CRUS-GALLI, Ait. *Cockspur Thorn.*

Smooth; *leaves* wedge-obovate, thickish, shining, serrate, entire near the base; *spines* very long; *corymbs* smooth; *styles* 1 to 3.

Borders of woods and thickets; rare. May, June. A thorny shrub or small tree 10 to 20 feet high, much branched. *Thorns* 2 to 3 inches long. *Leaves* nearly sessile 1 to 2½ inches long, ½ to ⅔ as wide. *Flowers* white, fragrant on corymbs, on very short lateral bractlets. *Sepals* lanceolate, smooth, sub-serrate. *Style* often solitary. *Fruit* red, pear-shaped or ovoid-oblong.

2. C. PUNCTATA, Jacq. *Common Thorn.*

Leaves wedge-obovate, cut-serrate, smooth, narrowed at base into a margined petiole, furrowed by the impressed straight veins; *corymbs* compound, and with the calyx pubescent when young.

Thickets, hedges and swamps; common. May. A small tree 12 to 25 feet high with rugged branches, usually armed with stout sharp thorns 1 to 2 inches long, sometimes nearly unarmed. *Bark* ash-colored. *Leaves* light green, mostly hairy. *Flowers* white, numerous. *Styles* 1 to 3. *Fruit* large, red or yellowish, globose, dotted.

3. C. PARVIFOLIA, Ait. *Dwarf Thorn.*

Leaves wedge-obovate or cuneate, nearly sessile, rounded at the apex, cuneate, serrate, rarely somewhat incised, pubescent; *flowers* subsolitary; *calyx lobes* foliaceous, incised as long as the petals; *styles* 5; *fruit* roundish, pyriform.

Sandy woods and banks of stream; not common. April, May. A much branched shrub 4 to 7 feet high, armed with a few long and sharp thorns. *Flowers* white, mostly solitary and terminal. *Fruit* ⅓ to ½ inch in diameter, red or yellow, eatable when ripe.

* * *Leaves incised, more or less lobed.*

4. C. TOMENTOSA, L. *Black Thorn.*

Leaves ovate-elliptic or oval-wedge-form, and narrowed at base into a short margined petiole, incisely serrate and sub-lobed towards the apex, smooth and furrowed above, tomentose beneath when young; *styles* 3 to 5; *fruit* pyriform.

Borders of woods and thickets; common. May, June. A large shrub 12 to 15 feet high, branching, armed with sharp thorns 1 to 2 inches long. *Leaves* 3 to 5 inches long, ½ to ⅔ as wide, acute at apex, on petioles ½ to 1 inch long. *Flowers* large, white, fragrant, in a large leafy compound corymb. *Fruit* large, orange-red, eatable, ripe in Sept.

5. C. COCCINEA, L. *White Thorn.*

Leaves roundish-ovate, thin, sharply cut and toothed, 5 to 9-lobed, somewhat cordate at base, on long slender petioles, nearly smooth; *styles* 3 to 5; *fruit* globose.

Thickets on borders of streams. May, June. A thorny shrub or small tree 12 to 20 feet high, with crooked and spreading branches. *Branchlets* white. *Thorns* stout, rigid, a little recurved, white, 1½ inches long. *Flowers* white in corymbs terminating the young branches. *Fruit* large, bright red or purple, eatable, ripe in Sept. Very variable.

6. C. CORDATA, Ait. *Washington Thorn.*

Smooth; *leaves* broadly-ovate and sub-cordate, on long and slender petioles acuminate, incised and serrate, mostly 3-lobed near the base; *styles* 5; *fruit* small, globose-depressed.

Banks of streams. June. A shrub 15 to 20 feet high, cultivated in the Middle States for hedge-rows, branching; the branches dark purple and armed with very sharp and slender thorns 2 to 3 inches long. *Leaves* often deeply 3 to 5-lobed, about 2 by 1½ inches. *Flowers* white, numerous, in corymbs terminating the branches. *Fruit* small, bright purple or red, numerous.

7. C. OXYCANTHA, L. *Hawthorn. English Thorn.*

Smooth; *leaves* broadly ovate, cuneate, 3 to 5-lobed, incised and serrate; segments of the calyx acute or acuminate; *styles* 1 to 3; *fruit* ovoid.

Roadsides, hedges, &c., sparingly naturalized. June. A very branching shrub 4 to 10 feet high; the branches armed with sharp, short, tapering thorns ½ inch long. *Leaves* variously lobed, pale beneath. *Petioles* ½ to 1 inch long, with 2 leafy stipules at base. *Flowers* white, in corymbs. *Fruit* small, purple when mature. Introduced from Europe.

16. AMALANCHIER. DC. JUNE BERRY.

CALYX 5-cleft. PETALS 5, oblong-obovate or ob-lanceolate. STAMENS many, rather shorter than the calyx. STYLES 5, somewhat united at base. POME when mature 3 to 5-celled.—*Small trees or shrubs with simple serrate leaves and white flowers in racemes.*

1. A. BOTRYAPIUM, DC. *June Berry. Shad Berry.*

Leaves cordate-oval, conspicuously acuminate, pubescent when young, smooth when mature; *flowers* in loose racemes, appearing before the leaves; *petals* linear-lanceolate, four times as long as the calyx.

Rich moist woodlands and hills; frequent. April. A handsome tree 10 to 20 feet high, with rather slender distant branches forming an open top. *Leaves* 2 to 3½ inches long, 1 to 2 wide, acutely serrate, on petioles ½ inch long. *Flowers* large white in loose racemes 2 inches long, terminating the branches, somewhat pendulous. *Fruit* dark purple, pleasant tasted, ripe in June, July.

2. A. OVALIS, DC. *Medler-bush.*

Leaves roundish elliptic, or oblong-oval, acute or acuminate, serrate, smooth when mature; *flowers* in compact racemes; *petals* obovate, oblong.

Fence-rows and woodlands; rare. April, May. A slender branching shrub 2 to 5 feet high. *Leaves* 1 to 2 inches long, and ¾ to 1 wide. *Flowers* white, in erect villose racemes. *Fruit* dark-purple or nearly black, pleasant tasted, ripe in July. Supposed by some botanists to be a variety of the preceding, but considered distinct by Beck, Darlington and others.

17. PYRUS. Linn. PEAR. APPLE.

CALYX-TUBE urn-shaped, the limb 5-cleft. PETALS roundish. STAMENS numerous. STYLES 2 to 5. POME fleshy or berry-like, the 2 to 5 carpels of a cartilaginous texture, each 2-seeded.—*Trees or shrubs with simple or pinnate leaves, and handsome white or flesh-colored flowers, in cymose corymbs.*

* SORBUS, Tourn. *Petals spreading. Styles 2 to 5. Leaves pinnate.*

1. P. AMERICANA, DC. *Mountain Ash.*

Leaflets 13 to 15, oblong-lanceolate, pointed, sharply serrate with pointed teeth, common petiole smooth when full grown; *flowers* in large compound cymes; *fruit* globose.

Swamps and mountain woods. May. A large shrub or low tree, 15 to 20 feet high, with the younger branches pubescent. *Leaves* 10 to 15 inches long. *Leaflets* 2 to 4 inches long, ½ to 1 wide, sub-opposite, often acute. *Flowers* small, white, very numerous. *Fruit* scarlet, very showy, remaining through the winter, somewhat acid. A low, smaller fruited variety is found on the Alleghenies.

* * ADENORACHIS, DC. *Petals spreading, with claws. Styles 2 to 5. Leaves simple, the midrib beset with glands along the upper side. Fruit berry-like.*

2. P. ARBUTIFOLIO, L. *Choke Berry.*

Leaves obovate, oblong or lanceolate, acute or acuminate, crenate-serrate, smooth above, veiny beneath, with 2 rows of glands along the midrib; *flowers* in corymbs; *fruit* nearly globose.

1. Var. MELANOCARPA is nearly smooth, with purplish-black fruit.

Damp thickets; common. May. A slender branching shrub 2 to 5 feet high. *Leaves* 1 to 2 inches long, ½ to 1 wide, the under surface usually very tomentose. *Flowers* numerous, nearly black, sweetish and astringent, ripe in Aug., Sept.

* * * MALUS, Tourn. *Petals spreading, flat. Styles 5, nearly united. Leaves simple without glands.*

3. P. CORONARIA, L. *Sweet-scented Crab Apple.*

Leaves broad ovate, rounded at base, cut serrate or lobed, smoothish; *corymbs* terminal, few-flowered, on long peduncles; *styles* woolly and united at base; *fruit* globose, depressed.

Borders of woods; common. May. A small tree 10 to 20 feet high, with spreading branches. *Flowers* large, fragrant, pale rose-color, in loose corymbs of 3 to 10. *Fruit* 1½ inches in diameter, pale-greenish-yellow, firm and hard, very acid, translucent and fragrant when ripe. Sept.

4. P. ANGUSTIFOLIA, Ait. *Narrow-leaved Crab Apple.*

Leaves oblong, or lanceolate, often acute at the base, crenate-dentate or almost entire, smooth, shiny above; *flowers* in corymbs; *styles* smooth and distinct; *pedicels* smooth.

Woods. April—May. A tree 15 to 20 feet high resembling the last, but with smaller leaves and fruit.

5. P. MALUS, L. *Common Apple Tree.*

Leaves ovate, or oblong-ovate, serrate, acute or short acuminate, pubescent above, tomentose beneath, petiolate, *corymbs*, sub-umbellate: *pedicels* and *calyx* villose-tomentose; *petals* with short claws: *styles* 5, united and villose at base; *pome* globose. Native of Europe, and almost naturalized with us. Probably nearly 1000 varieties are cultivated in the United States.

6. P. COMMUNIS, L. *Pear Tree.*

Leaves ovate-lanceolate, sub-serrate, smooth above, pubescent beneath, acute or acuminate: *corymbs* racemose; *calyx* and *pedicels* pubescent; *styles* 5, distinct and villose at base; *pome* pyriform. Native of Europe. *Flowers* white. Numerous varieties are cultivated in the United States.

18. CYDONIA. Tourn.

Named from *Cydonia*, a town in Crete, from whence it was brought.

Calyx urn-shaped, limb 5-cleft. Petals 5. Stamens many. Styles 5. Pome 5-carpelled; *carpels* cartilaginous, many-seeded. Seeds covered with mucilaginous pulp.—*Trees or shrubs, with simple leaves, and mostly solitary flowers.*

C. vulgaris, Pers. *Quince.*

Leaves oblong-ovate, obtuse at base, acute at apex, very entire, smooth above, tomentose beneath: *peduncles* solitary, and with the calyx woolly: *pome* tomentose, obovoid. *Shrubs* about 8 to 12 feet high, with crooked straggling branches. *Flowers* white, with a tinge of purple, large, terminal. *Fruit* clothed with a soft down, yellow when ripe. highly esteemed for jellies and preserves.

C. Japonica, or *Scarlet Pyrus*. a low straggling shrub with beautiful scarlet showy flowers, is occasionally met with in cultivation.

Order 41. CALYCANTHACEÆ.

Shrubs with square stems exhibiting 4 axis of growth surrounding the central one, with opposite, entire, simple leaves, without stipules, and axillary solitary flowers. Sepals and *petals* confounded, indefinite, imbricate, combined in a fleshy tube. Ovaries several, simple. Achenia hard, enclosed in the calyx-tube.

CALYCANTHUS. Linn.

Gr. *kalux*, a *calyx* and *anthos*, a *flower;* the calyx resembling a corolla.

Lobes of the calyx imbricated in many rows, lanceolate, colored, all more or less leathery or fleshy. Stamens about 12, unequal, deciduous, the outer ones fertile. Anthers extrorse.—*Shrubs with lurid purple, fragrant flowers, and with the bark and leaves exhaling the odor of camphor.*

C. Floridus, L. var. *lævigatus*, Torr. & Gr. *Sweet Scented Shrub. Carolina Allspice.*

Leaves oblong or oval, gradually acuminate, somewhat rugose. smooth and green on both sides; *branches* straight, erect; *lobes* of the *calyx* lanceolate.

Mountains and fertile soils along streams; rare. May, June. A handsome shrub. cultivated in gardens. 4 to 6 feet high. *Flowers* large, solitary, terminal. *Calyx* brownish-purple, very fragrant.

Order 41. MELASTOMACEÆ.

Herbs, shrubs or trees, with opposite mostly entire ribbed leaves, and terminal solitary or cymose flowers. Anthers opening by pores at the apex; otherwise much as in Onograceæ. (Evening Primrose Family.)

1. RHEXIA. Linn. Meadow Beauty.

Calyx-tube urn-shaped, narrowed at the apex, the limb

4-cleft. Petals 4, obovate, inserted with the 8 stamens on the summit of the calyx-tube. Anthers 8, long, curved, attached to the filaments behind, naked at base. Style 1. Stigma 1. Capsule free in the calyx, with 4 many-seeded placentæ projecting from the central axis. Seeds coiled like a snail shell, without albumen.—*Low perennial herbs, often bristly, with sessile 3 to 5-nerved, and bristle-edged leaves, and showy cymose purplish flowers.*

1. R. Virginica, L. *Deer Grass. Meadow Beauty.*

Stem square, with wing-like angles; *leaves* oval-lanceolate, acute, sessile, ciliate, serrate, sprinkled with hairs on both sides; *calyx* hisped.

Wet meadows and sandy swamps. July, Aug. *Stem* a foot high, often dichotomously branched above. *Leaves* with 3 (rarely 5 or 7) prominent nerves, 1 to 3 inches long, half as wide. *Flowers* large, in corymbose cymes. *Petals* reddish-purple, obovate, hisped beneath, caducous. *Anthers* long and prominent, crooked, golden yellow above with a purple line beneath. *Style* long, a little declined.

2. R. Mariana, L. *Maryland Deer Grass.*

Stem nearly round, covered with bristly hairs; *leaves* lanceolate, or linear-oblong, acute at each end, sparingly hisped on both sides, ciliate-serulate; *calyx* hisped.

Wet grounds. July, Aug. *Stem* 1 to 2 feet high, slender, with opposite branches. *Flowers* situated in the forks and terminations of the branches. *Petals* obovate, hairy on the outer surface, flesh-colored or white dilated with rose-red. *Anthers* yellow. *Style* larger than the stamens.

Order 42. **LYTHRACEÆ.**

Herbs rarely shrubs, with usually 4-sided branches, mostly opposite entire leaves, without stipules, and rarely irregular flowers, axillary or whorled, sometimes in racemes or spikes. Calyx tubular, the limb 4 to 7-lobed, sometimes with as many intermediate teeth. Petals inserted between the teeth of the calyx, sometimes wanting. Stamens as many, or 2 to 4 times as many as the petals, inserted into the tube of the calyx. Style 1; stigma capitate, or rarely 2-lobed. Ovary superior, 1 to 6-celled. Capsule membraneous, covered by the calyx, dehiscent. Seeds numerous, small.

1. DECODON. Gmel.

Gr. *deka,* ten, and *odous,* a tooth, from the ten-toothed calyx.

Calyx short, broadly bell-shaped, with 5 erect teeth and 5 longer and spreading horn-like processes. Petals 5, wedge-lanceolate. Stamens 15, 5 very long, the alternate ones shorter. Styles filiform. Capsule covered with the calyx, globose 3 to 4-celled, many-seeded.—*Perennial herbs, with opposite or whorled lanceolate almost sessile leaves, and clustered pedicelled flowers in their axils.*

1. D. verticellatum, Ell. *Swamp Willow Herb.*

Swamps and wet places. Aug. *Stems* 2 to 6 feet long, sometimes prostrate and rooting, 4 to 6-angled, smooth or pubescent. *Leaves* opposite or in whorls of 3, 3 to

5 inches long, gradually acuminate or acute at apex, on short petioles. *Flowers* in axillary sub-sessile umbels, apparently whorled, constituting a long, leafy, terminal and showy panicle. *Petals* 5 to 6, large, and of a fine purple.

CUPHEA. Jacq.

Gr. *kuphos*, curved; in reference to the form of the calyx.

CALYX tubular, 12-ribbed, somewhat inflated below, gibbous or spurred at the base, on the opposite side, 6-toothed at the apex, with usually as many little intermediate processes. PETALS 6 to 7, unequal. STAMENS mostly 12, approximate in 2 sets, included, unequal. STYLE filiform. STIGMA 2-lobed. CAPSULE membranaceous, 1 to 2-celled, few-seeded.—*Herbaceous or half shrubby plants, with opposite entire leaves, and axillary and terminal flowers.*

C. VISCOSISSIMA, Jacq. *Clammy Cuphea.*

Viscid-pubescent; *leaves* opposite, ovate-lanceolate, long-stalked, rough; *flowers* lateral, and solitary, on short peduncles; *petals* ovate, short-clawed.

Fields and roadsides. July, Aug. Annual. *Stem* 10 to 15 inches high, erect, branching. *Leaves* 1 to 2 inches long, ⅓ as wide, on petioles ¼ to ½ inch long. *Calyx* often purple, ventricose. *Petals* violet-colored. *Stamens* included. *Capsule* bursting lengthwise before the seeds are ripe.

ORDER 43. **ONAGRACEÆ.**

Herbaceous plants or shrubs, with simple alternate or opposite leaves, and axillary terminal flowers of various colors. PETALS 4, (sometimes 2 or 3). STAMENS 1—2—3 inserted with the petals into the throat of the calyx. OVARY 2 to 4-celled, cohering with the calyx-tube; PLACENTÆ in the axis. FRUIT baccate or capsular, 2 to 4-celled, many seeded. There are two sub-orders.

SUB-ORDER I. ONOGRACEÆ PROPER.

CALYX-TUBE often prolonged beyond the ovary, the petals and stamens inserted on its summit. STAMENS 2—4—8. STYLES single, slender. STIGMA 2 to 4-lobed, or capitate. OVARY 4-celled. SEEDS without albumen.

1. EPILOBIUM. Linn. WILLOW-HERB.

Gr. *epi*, upon, *lobou*, a pod, *ion*, a violet, viz: a violet on a pod.

CALYX-TUBE not prolonged beyond the ovary, 4-sided; *limb* 4-parted, deciduous. PETALS 4. STAMENS 8. ANTHERS short, fixed by the middle. STIGMA often with 4 spreading lobes. OVARY and CAPSULE linear, 4-cornered, 4-celled, 4-valved. SEEDS numerous, crowned with a tuft of hairs.—*Herbaceous perennials, with nearly sessile leaves, and violet, purple or white flowers.*

1. E. ANGUSTIFOLIUM, L. *Willow Herb. Rose-bay.*

Stem simple, erect; *leaves* scattered, lanceolate, sparingly denticulate with a marginal vein; *flowers* large, pedicelled, in a terminal spike; *petals* clawed; *stamens* unequal, declined; *style* at length deflexed.

Newly cleared land, and waste places. July. *Stem* 4 to 6 feet high, often branched above. *Leaves* sessile, smooth, 2 to 5 inches long, ¼ as wide, acuminate with pellucid veins. *Flowers* numerous and showy, colored in all their parts, deep-lilac-purple, in a raceme often a foot long.

2. E. COLORATUM, Muhl. *Colored Epilobium.*

Stem subterate, erect, very branching, pubescent; *leaves* mostly opposite, lanceolate, serrulate, acute, somewhat petioled, smooth; *petals* small, 2-cleft at the apex; *stigma* club-shaped.

Ditches and wet shady grounds; common. July, Aug. *Stem* 1 to 3 feet high, much branched, often purplish. *Leaves* 2 to 4 inches long, ¼ as wide, with minute white dots, upper ones alternate and sessile, lower on short petioles. *Flowers* small purplish fading to white, axillary near the extremity of the branches.

3. E. PALUSTRIS, L. *Marsh Willow Herb.*

Minutely hoary; *stem* slender, roundish, at length much branched; *leaves* nearly sessile, lanceolate or linear, acutish at both ends, slightly toothed or entire; *petals* small, obcordate, twice as long as the calyx; *style* included; *stigma* undivided, clavate.

Swamps and marshy places. Aug., Sept. *Stem* 1 to 2 feet high, very branching. *Leaves* mostly alternate, 1 to 3 inches long, ⅓ as wide. *Flowers* numerous, axillary, rose-color. *Capsule* 1 to 2 inches long, pubescent.

4. E. MOLLE, L. *Soft Willow Herb.*

Soft downy all over; *stem* round, straight, erect, branching above; *leaves* crowded, lanceolate or linear-oblong, alternate or opposite, mostly entire.

Swamps; rare. Aug., Sept. *Stem* 1 to 2 feet high. *Leaves* numerous, ¾ to 1¼ inches long, ¼ as wide. *Flowers* rose-color, axillary in the upper part of the stem. *Petals* deeply notched, twice as long as the calyx. *Stigma* large and thick. *Capsule* 3 inches long on a short pedicel.

ŒNOTHERA. Linn. EVENING PRIMROSE.

Gr. *oinos*, wine; and *thera*, a chase: application uncertain.

CALYX-TUBE prolonged beyond the ovary, deciduous; the lobes 4, reflexed. PETALS 4. STAMENS 8. ANTHERS mostly linear. STIGMA 4-lobed or capitate. CAPSULE 4-valved, many-seeded. SEEDS naked.—*Herbaceous plants, with alternate leaves, and mostly yellow flowers.*

1. Œ. BIENNIS, L. *Common Evening Primrose.*

Stem erect, mostly hairy; *leaves* oval-lanceolate, acute, obscurely toothed, pubescent; lower ones on short petioles; *flowers* in a terminal rather leafy spike; *petals* obcordate; *capsule* sessile, obtusely 4-angled, somewhat swelled. Var. 1. MURICATA (Œ, *muricata*, Ph.) *Stem* muricate or strigosely hirsute, red; *petals* scarcely longer than the stamens. Var. 2. GRANDIFLORA (Œ, *grandiflora*, Ait.) *Petals* much longer than the stamens, deeply obcordate. *Stem* branched. Biennial.

Fields and waste places; common. June, Aug. *Stem* 2 to 5 feet high, simple or branching from the base. *Leaves* 3 to 6 inches long, ½ to 1½ wide, roughly pubescent; *radical ones* tapering into a petiole. *Flowers* numerous, light-yellow, fragrant, opening after sunset and closing next day, in a spike 3 to 12 inches long.

2. Œ. FRUTICOSA, L. *Sundrops. Per. Eve'g Primrose.*

Stem erect, simple or nearly branched, pubescent or hirsute; *leaves* oblong or lanceolate, slightly toothed; *petals* broadly obcordate, longer than the calyx-lobes and stamens; *capsule* oblong-club-shaped, 4-winged, longer than the pedicels.

Open places; common. June—Aug. Per. *Stem* hard, rigid, 1 to 3 feet high, branched, purple. *Leaves* variable in pubescence. form and size. *Flowers* large, 1½ inches in diameter, bright yellow, in a peduncled corymb.

3. Œ. PUMILA, L. *Dwarf Evening Primrose.*

Low, pubescent; *stem* ascending; *leaves* lanceolate or oblanceolate, mostly obtuse, attenuate at base, entire; *flowers* in a loose and prolonged leafy raceme; *petals* obcordate, scarcely longer than the stamens.

Dry fields. July, Aug. Biennial. A small half-erect plant, 6 to 10 inches long, with a round, slender simple stem. *Leaves* 1 to 1½ inches long, ¼ to ½ inch wide; *radical ones* spatulate, petiolate. *Flowers* yellow, ½ inch broad, opening in succession, 1 or 2 at a time. *Capsule* oblong-club-shaped, nearly sessile, 8-angled.

GAURA. Linn.

Gr. *gauros*, superb; on account of the showy flowers of some species.

CALYX-TUBE much prolonged beyond the ovary, deciduous; *limb* 4-cleft, reflexed. PETALS 4, clawed, somewhat unequal, inserted into the tube. STAMENS 8, declinate. STYLE long. STIGMA 4-lobed. FRUIT 4-angled, dry and indehiscent, by abortion mostly 1-celled, 1 to 4-seeded. SEEDS naked.—*Herbaceous or shrubby plants, with alternate leaves and rose-color or white changing to red flowers, in wand-like spikes or racemes.*

G. BIENNIS, L. *Biennial Gaura.*

Whole plant softly hairy or downy; *leaves* lanceolate, remotely dentate, alternat, sessile; *flowers* numerous, sessile, in terminal spikes; *fruit* sub-sessile, 8-ribbed, pubescent.

Banks of streams. July, Aug. A handsome biennial 3 to 5 feet high. *Leaves* pale-green, acute at each end. *Calyx* reddish. *Corolla* rose-color, changing to deep red. *Fruit* rarely with more than one mature seed.

LUDWIGIA. Linn.

In honor of *C. D. Ludwig*, Prof. of Botany at Leipsic, about 1750.

CALYX-TUBE not prolonged beyong the ovary; *limb* 4-lobed, usually persistent. PETALS 4, equal, obcordate, often small or wanting. STAMENS 4; opposite the apex. STYLE short. CAPSULE short, 4-celled, 4-valved, many-seeded and crowned with the persistent calyx lobes.—*Perennial herbs, with entire mostly alternate leaves and axillary flowers, often yellow or apetalous.*

1. L. ALTERNIFOLIA, L. *Seed-box.*

Nearly smooth; *stem* erect, branched; *leaves* alternate, lanceolate, acute or pointed at both ends, sessile, pale beneath; *peduncles* axillary, 1-flowered, 2-bracted above the middle; *petals* scarcely as long as the spreading acuminate sepals; *capsule* large, with 4 winged angles, crowned with the colored calyx.

Shady swamps. July. *Stem* 1 to 3 feet high, round with a strong bark, and several branches. *Leaves* 2 to 3 inches long, ½ to 1 wide, with marginal veins. *Sepals* large, reddish. *Petals* large, ovate, yellow, soon falling off.

* *Petals very minute or none.* ISNARDIA.

2. L. SPHÆROCARPA, Ell. *Round-fruited Ludwigia.*

Nearly smooth; *stem* erect, much branched; *leaves* lanceolate, acute, tapering at the base, alternate; *flowers* solitary, axilliary, or clustered towards the summit of the branches; *petals* mostly none; *capsule* globular, obscurely 4-sided, very small.

In water and swampy places; rare. July, Aug. *Stem* 2 to 3 feet high, angular reddish. *Margin* of the *leaves* rough. *Flowers* greenish, inconspicuous.

3. L. PALUSTRIS, L. *Water Purslane.*

Smooth, low; *stem* procumbent at base, rooting or floating; *leaves* opposite ovate-lanceolate, tapering into a slender petiole; *flowers* axillary, solitary, sessile; *capsule* sub-ovate, slightly angled.

Floating in water, or creeping in muddy places; common. June—Oct. *Stem* succulent, purplish, 10 to 20 inches long. *Leaves* and slender petioles 1½ by ½ inches, ovate-spatulate. *Flowers* very small. *Calyx-lobes* and *style* very short. *Petals* when present, flesh-color.

CIRCÆA. Tourn. ENCHANTER'S NIGHTSHADE.

Named from *Circe*, the enchantress.

CALYX slightly produced above the ovary, deciduous; *limb* 2-parted. PETALS 2, inversely heart-shaped. STAMENS 2, alternating with the petals. CAPSULE reflexed, obovate, 2-celled, 2-seeded, bristly with hooked hairs.—*Low inconspicuous perennials, with opposite leaves on slender petioles, and small whitish flowers in racemes.*

1. C. LUTETIANA, L. *Common Enchanter's Nightshade.*

Stem erect, mostly pubescent; *leaves* ovate, sub-cordate, acuminate, toothed, longer than the petiole; *bracts* none; *fruit* reflexed, bristly.

Moist woodlands; common. July. *Stem* 1 to 2 feet high, sparingly branched, tumid at the nodes. *Leaves* dark-green, 2 to 4 inches long, ½ as wide. *Flowers* small, reddish-white, in a long terminal raceme.

2. C. ALPINA, L. *Alpine Enchanter's Nightshade.*

Low, smooth and weak; *leaves* cordate, shining, coarsely toothed, the lower ones as long as the petiole; *bracts* minute.

Cold, moist, shady places. July. A small delicate plant 3 to 8 inches high. *Stem* transparent, juicy. *Leaves* 1 to 2 inches long, ⅔ as wide. *Flowers* white, minute, in terminal racemes.

SUB-ORDER II. HALORAGEÆ.

Marsh or water plants, with very small axillary sessile *flowers, often monœcious or diœcious.* Calyx-tube not at all prolonged, the lobes obsolete or none. Petals 3 to 4, often none. Stamens 1 to 8. Ovary inferior, 1 to 4-celled. Fruit dry, indehiscent, 1 to 4-celled. Seeds pendulous, 1 in each cell.

PROSERPINACA. Linn. Mermaid-weed.

Lat. *proserpo*, to creep; the stems creeping and rooting at the base.

Calyx-tube 3-sided, *limb* 3-parted. Petals none. Stamens 3. Stigmas 3. Fruit long, 3-angled, 3-celled, 3-seeded, nut-like.—*Low perennial aquatic herbs, with the stems creeping at the base, alternate leaves, and small fertile flowers sessile in the axils, solitary or 3 or 4 together.*

1. P. palustris, L. *Common Mermaid-weed.*

Upper leaves linear-lanceolate, serrate; *lower ones* often pinnatifid; *fruit* sharply 3-angled.

Wet swamps; rare. July. Aug. *Stem* 12 to 18 inches long, roundish. *Leaves* about 1 inch long, ¼ wide, acute at each end, *lower ones* on short petioles, if submerged pinnatifid with linear segments like the teeth of a comb. *Flowers* greenish, sessile, 1 to 3 together. *Stigmas* purple, cylindrical.

2. P. pectinacea, Lam. *Cut-leaved Mermaid-weed.*

Leaves all pectinate, the divisions linear-awl-shaped; *fruit* rather obtusely 3-angled.

Sandy swamps; rare. Aug. *Stems* 5 to 15 inches high, ascending at base from long creeping roots. *Leaves* all regularly and finely divided into very narrow segments like the teeth of a comb. *Styles* none. *Stigmas* attenuate above.

MYRIOPHYLLUM. Vaill. Water Milfoil.

Gr. *murios*, a myriad, *phullon*, a leaf; from the numerous divisions of the leaf.

Flowers monœcious or polygamous. Calyx of the sterile flowers 4-parted, of the fertile 4-toothed. Petals 4, or none. Stamens 4 to 8. Fruit nut-like, 4-celled, deeply 4-lobed. Stigmas 4, recurved.—*Submersed aquatic perennial herbs, with crowded often whorled leaves, those immersed pinnately parted into capillary divisions, and sessile flowers in the axils of the upper leaves: upper ones staminate.*

* *Stamins* 8; *petals deciduous; leaves whorled in threes.*

1. M. spicatum, L. *Spiked Water Milfoil.*

Leaves all pinnately parted and capillary; *floral ones* or *bracts* shorter than the flowers, ovate entire; *lower ones* sub-serrate and larger; *petals* broadly ovate; *stamens* 8.

In water. Aug., Sept. *Stem* slender, branched, varying in length with the depth of the water, the flowers only rising above the surface. *Leaves* composed of innumerable, hair-like segments. *Flowers* greenish sessile. *Carpels* smooth.

2. M. VERTICILLATUM, L. *Whorled Water Milfoil.*

Leaves verticellate pinnately divided into capillary or setaceous segments; *floral leaves* pectinate pinnatifid, usually longer than the flowers; *petals* oblong-obovate; *carpels* smooth and even.

In water. July—Sept. *Stem* long and stouter than in the preceding, only the upper part emerging. *Flowers* small, green, in a terminal spike with conspicuous floral leaves.

3. M. HETEROPHYLLUM, Michx. *Various-leaved Water Milfoil.*

Stem rather stout; *floral leaves* ovate and lanceolate, thick, crowded, sharply serrate; *lower leaves* pinnatifid; *petals* oblong; *fruit* obscurely roughened.

In sluggish water. July. *Stem* thick and branching. *Leaves* very various, *lowest* finely divided. *Flowers* purple, whorled in the axils of the upper leaves. *Sepals* minute. *Petals* somewhat persistent. *Stamens* sometimes only 4 to 6.

* * *Stamens 4; leaves whorled in fours and fives, the lower finely divided.*

4. M. AMBIGUUM, *Ambiguous Water Milfoil.*

Submersed leaves cut into capillary segments; the *emersed ones* pectinate: *floral ones* linear, tapering into a short petiole, toothed or entire: *flowers* mostly perfect; *petals* oblong; *carpels* smooth and even.

Ponds and ditches. July, Aug. *Stems* 2 to 6 inches long and creeping in the mud, or when floating in water, long and slender. *Leaves* variously divided, when the stems are procumbent and rooting the leaves are all linear, rigid, and often entire, but when submersed they are finely divided like the teeth of a comb. *Flowers* small purplish.

HIPPURIS. Linn. MARE'S-TAIL.

Gr. *hippus*, a horse, and *oura*, a tail.

CALYX entire. PETALS none. STAMEN 1, inserted on the edge of the calyx. STYLE single, thread-shaped, stigmatic down one side, received in the groove between the lobes of the anther. FRUIT nut-like, 1-celled, 1-seeded.—*Perennial aquatics with simple entire leaves in whorls, and minute flowers sessile in the axils, perfect or polygamous.*

H. VULGARIS, L. *Common Mare's-tail.*

Leaves in whorls of 8 to 12, linear, acute, smooth, entire.

Borders of ponds and springs; rare. *Stem* 12 to 18 inches high, simple, erect. *Flowers* at the base of the upper whorls, one to each leaf, small.

ORDER 44. **CACTACEÆ.** CACTUS FAMILY.

Fleshy and thickened leafless plants of peculiar aspect, globular or columnar and many-angled or flattened and jointed, usually with prickles. Flowers solitary, sessile; the sepals and petals numerous, imbricated in several rows. STAMENS numerous, with long and slender filaments, inserted on the inside of the tube or cup formed by the union of the sepals and petals. STYLE 1. STIGMAS numerous, FRUIT a 1-celled succulent berry, many-seeded.

OPUNTIA. Tourn. Prickly Pear.

Sepals and petals not prolonged into a tube, spreading, the inner roundish. Stamens numerous, shorter than the petals. Style with numerous erect stigmas.—*Stem composed of flat and usually broad joints, bearing clusters of bristles often with spines intermixed, arranged in a special order.*

O. vulgaris, Mill. *Indian Fig. Cow's-tongue.*

Stems low, prostrate-spreading, of obovate joints, armed with short barbed bristles, rarely with a few spines; *flowers* sessile, on the margin of the joints.

Dry rocks and sandy soils; rare. June, July. *Flowers* large, sulphur-yellow. *Fruit* obovate, umbillicate, nearly smooth, eatable. *Seeds* numerous, immersed in the crimson pulp. Cultivated.

Order 45. GROSSULACEÆ. Currant Family.

Low shrubs, sometimes prickly, with alternate palmately lobed leaves, a 5-lobed calyx cohering with the 1-celled ovary, and bearing 5 small petals and 5 stamens. Fruit a 1-celled berry, with 2-parietal placentæ crowned with a minute embryo at the base of hard albumen.

RIBES. Linn.

Calyx companulate or tubular, 5-parted, sometimes colored. Petals small, inserted alternately with the stamens in the throat of the calyx. Stamens 5, very short. Styles 2, distinct or united. Berry crowned with the shrivelled remain of the flowers, 1-celled, pulpy, many-seeded.—*Leaves often clustered in the axils, with the flowers from the same clusters or from separate buds.*

* *Stem unarmed; flowers in racemes: berries never prickly.* Currants.

1. R. floridum, L'Her. *Wild Black Currant.*

Leaves sub-cordate, 3 to 5-lobed, sprinkled on both sides with yellowish resinous dots, doubly serrate, on long petioles; *racemes* drooping, many-flowered, downy; *bracts* longer than the pedicels: *calyx* tubular, bell-shaped: *fruit* obovoid.

Woods and hedges: common. May. A handsome shrub 3 to 4 feet high. *Leaves* 1 to 2 inches long 1½ to 2½ wide, on petioles 1 to 2 inches long. *Flowers* somewhat bell-shaped, greenish yellow. *Fruit* black, smooth, insipid.

The R. *nigrum* or *black currant* of the gardens. Native of Europe, is probably not distinct from this species.

2. R. prostratum, L'Her. *Mountain Currant.*

Stem reclining or prostrate; *leaves* deeply cordate, 5 to 7-lobed, smooth; the lobes ovate, acute, doubly serrate; *racemes* erect, slender; *calyx* rotate, segments obovate; *petals* spatulate, small; *fruit* glandular-hisped.

Mountains and rocky hills. May, June. A small procumbent shrub with erect branches 1 to 3 feet high. *Racemes* erect, about 8-flowered, at length pendulous. *Bracts* very short. *Flowers* marked with purple. *Berries* red, ill-scented. The whole plant has a disagreeable odor.

3. R. RUBRUM, L. *Red Currant.*

Stems straggling or reclined; *leaves* somewhat heart-shaped, obtusely 3 to 5-lobed, serrate, downy beneath; *racemes* nearly smooth, drooping from lateral buds, distinct from the leaves; *calyx* flat; *fruit* globose, smooth. This is the common *red currant* of the gardens, so universally cultivated. Indigenous in swamps and mountains from New York to Wisconsin, and may probably be found in Western Pennsylvania.

4. R. AUREUM, Pursh. *Missouri, or Golden Currant.*

Plant smooth; *leaves* 3-lobed, lobes spreading entire or with a few large teeth; *petioles* longer than the leaves; *bracts* linear; *racemes* loose, many-flowered; *calyx* tubular; *segments* oblong, obtuse; *petals* linear; *fruit* smooth, oblong or globose; A beautiful shrub, 6 to 10 feet high, with numerous yellow, very fragrant flowers, appearing from April to May. *Fruit* yellow, finally brown. Native of Missouri and Oregon. Common in cultivation.

* * *Stem usually armed with sub-axillary spines, often prickly: berries prickly or smooth.* GOOSEBERRIES.

5. R. CYNOSBATI, L. *Prickly Gooseberry.*

Stem unarmed or prickly; *sub-axillary spines* 1 to 3; *leaves* cordate, roundish, pubescent, with 3 to 5 incisely toothed lobes; *peduncles* slender, 2 to 3-flowered; *stamens* and style not longer than the broad companulate calyx-tube; *petals* obovate shorter than the calyx segments.

Rocky woods and mountains. May, June. A handsome shrub 2 to 4 feet high, branching, the lower part of the stem often prickly. *Flowers* greenish-white, in pendulous racemes. *Berries* usually with long prickles, brownish purple.

6. R. HIRTELLUM, Michx. *Rough Wild Gooseberry.*

Stem unarmed, rarely prickly; *leaves* roundish, cordate, 3 to 5-lobed, toothed, pubescent beneath; *peduncles* very short, deflexed, 1 to 2-flowered, smooth; *calyx-tube* bell-shaped, the segments twice as long as the petals; *styles* hairy, 2-cleft; *fruit* smooth.

Rocky places. May, June. *Stem* 2 to 3 feet long. *Leaves* ¾ to 1½ inches in diameter, generally cleft half to the middle. *Flowers* nodding, greenish. *Fruit* bluish-purple, pleasant-tasted.

7. R. ROTUNDIFOLIUM, Michx. *Wild Gooseberry.*

Stem without prickles; *sub-axillary spines* mostly solitary, short; *leaves* roundish, nearly smooth, 3 to 5-lobed, incisely dentate; *peduncles* slender, 1 to 2-flowered; *stamens and 2-parted style* slender, longer than the narrow cylindrical calyx; *fruit* smooth.

Mountain woods; common. May, June. *Stem* 3 to 4 feet high, with a whitish bark. *Leaves* 1 to 2 inches in diameter, mostly truncate at base, shining above, on ciliate petioles 1 to 3 inches long. *Flowers* whitish, with a tinge of purple. *Fruit* purple when ripe, well flavored, resembling the garden gooseberry.

8. R. LACUSTRES, Poir. *Swamp Gooseberry.*

Young stems clothed with bristly prickles, and with several weak thorns; *leaves* deeply 3 to 5-lobed, cordate at base, lobes deeply incised; *raceme* 5 to 9-flowered, pilose; *calyx* broad and flat; *stamens* and style not longer than the petals; *fruit* bristly.

Mountain swamps; rare. May, June. *Stem* 3 to 4 feet high, reddish from the numerous prickles, which differ from the spines only in size. *Leaves* shining above, 1½ to 2½ inches in diameter, on ciliate hisped petioles longer than the leaves *Flowers* small, greenish-yellow. *Fruit* bristly, dark-purple, unpleasant to the taste.

9. R. UVA-CRISPA, *Garden Gooseberry.*

Stem prickly; *leaves* roundish, 3 to 5-lobed, hairy beneath, on short hairy potioles; *peduncles* hairy, 1-flowered; *calyx* bell-shaped; *style* hairy; *fruit* smooth or hairy, globose. Native of England. Common in cultivation. Varieties numerous, with red, green and amber fruit very large.

ORDER 46. PASSIFLORACEÆ.

Herbaceous or shrubby plants, usually climbing by tendrils, alternate, often glandular leaves, foliaceous stipules, and axillary and terminal flowers often with a 3-leaved involucre. SEPALS 5, combined in a tube, the throat crowned with a double or triple fringe. PETALS 5, arising from the throat of the calyx, sometimes wanting. STAMENS 5, monodelphous, rarely indefinite, surrounding the stipe of the ovary. STYLES 3. OVARY superior, on a large stipe, 1-celled. FRUIT many-seeded, placentæ, sometimes 3-valved.

1. PASSIFLORA. Linn. PASSION-FLOWER.

Lat. *passio,* passion, and *flos,* a flower; the several parts of the flowers, were compared to the instruments of the Saviour's passion.

CALYX colored, deeply 5-parted, the throat crowned with a double or triple fringe. PETALS 5, inserted into the calyx, or none. STAMENS 5; their filaments situated on the stipe of the ovary, separate and spreading. ANTHERS large, fixed by the middle. STIGMAS 3, club-shaped, capitate. FRUIT a pulpy berry, many-seeded.—*Perennial climbing herbs or shrubs, with palmately lobed leaves, generally with stipules, and showy flowers on axillary peduncles.*

1. P. LUTEA, L. *Yellow Passion-flower.*

Smooth, slender; *leaves* cordate, 3-lobed; *petioles* without glands; *stipules* minute; *peduncles* mostly in pairs; *petals* narrow, much longer than the calyx.

Banks of streams; Southern part of the State. June, July. *Stem* climbing, slender, 3 to 10 feet long. *Leaves* yellowish-green, nearly as broad as long. *Flowers* small, greenish-yellow. *Crown* in 3 rows, the inner row a membraneous disk with a fringed border. *Fruit* dark-purple.

2. P. INCARNATA, L. *Flesh-colored Passion-flower.*

Leaves smooth, 5-nerved, deeply 3-cleft, lobe oblong, acute, serrate; *petioles* with 2 glands; *involucre* 3-leaved, obovate, glandular, serrate; *crown* triple; *ovary* smooth. A handsome cultivated species, native of the Southern States. *Stem* climbing, 10—20—30 feet. *Flowers* large and showy, on pedicels. *Petals* white, oval-oblong. Two outer rows of filaments long, purple with a whitish base, the inner row of short rays, flesh-color. *Berry* pale-yellow, eatable.

ORDER 47. CUCURBITACEÆ.

Herbaceous mostly succulent vines, with tendrils, alternate palmately veined leaves, and axillary monœcious or diœcious flowers. CALYX 5-toothed, sometimes indistinct. *Corolla* 5-parted, scarcely distinguishable from the calyx, strongly marked with reticulated veins. STAMENS 5, distinct, or cohering in 2 or 3 sets. ANTHERS sinuous. OVARY adherent, 1-celled; STYLE short; STIGMA very thick, velvety or fringed. FRUIT a *pepo* more or less succulent, often 1-celled by obliteration. SEEDS flat, with no albumen, often winged.

1. SICYOS. Linn.

Gr. *sikuos*, the ancient name of the cucumber.

FLOWERS monœcious. PETALS 5, united below into a bell-shaped or flattish corolla. STAMENS 5, monodelphous or at length triadelphous; *anthers* contorted. STYLES 3, united at the base. FRUIT ovate membranaceous, filled by the single seed, covered with barbed prickly bristles which are readily detached.—*Climbing annuals, with compound tendrils, and whitish flowers, the sterile and fertile mostly from the same axils, the former corymbed, the latter in a long-peduncled capitate cluster.*

1. S. ANGULATUS, L. *Single-seed Cucumber.*

Stem branching, hairy; *leaves* roundish, heart-shaped, and 5-angled-lobed, the lobes minutely toothed, pointed; *pistillate flowers* much smaller than the *staminate.*

Banks of streams. July, Aug. A weak climbing vine with long spiral tendrils. *Leaves* 3 to 4 inches broad, on long stalks. *Flowers* whitish, marked with green lines. *Fruit* ½ inch long, ovate, spinous, 8 to 10 together in a crowded cluster.

2. ECHINOCYSTIS. Torr. & Gray.

Gr. *echinos*, prickly, and *kustis*, a bladder; in allusion to the appearance of the fruit

FLOWERS monœcious. CALYX flattish, segments 5, filiform subulate. PETALS 6, united at the base into an open spreading corolla. STAMENS 3, diadelphous. STYLE 1; *stigmas* 3, fringed. OVARY 2-celled, with 2 erect ovules in each cell. FRUIT globose-ovoid, bristly-echinate, 2-celled, 4-seeded.—*A rank tall-climbing annual, with branching tendrils, sharply 5-lobed thin leaves, and very numerous small greenish-white flowers.*

E. LOBATA, Torr. & Gray. *Wild Balsam Apple.*

Leaves palmately 5-lobed, cordate at base, lobes acuminate, denticulate; *flowers* small, the barren ones very numerous, in axillary racemes, the fertile ones solitary or several, situated at the base of the raceme.

Rich river soils. July—Sept. A smoothish running vine. *Stem* deeply furrowed, with long 3-parted tendrils placed nearly opposite the long petioles. *Fruit* 1 to 2 inches long, at length dry and membranaceous, with 4 large seeds.

3. MELOTHRIA. Linn.

FLOWERS polygamous or monœcious. STERILE FLOWERS, *calyx* 3 to 5-toothed; *corolla* companulate; *filaments* 5, in 3 sets. FERTILE FLOWERS, *calyx* and *corolla* as in the sterile; *style* 1; *stigmas* 3, fimbriate. FRUIT 3-celled, many-seeded.—*A slender climbing annual, with simple tendrils, five lobed leaves, and small yellowish flowers.*

M. PENDULA, L. *Small Creeping Cucumber.*

Leaves roundish-cordate, 5-lobed or angled, slightly hispid; *flowers* axillary, the sterile in small racemes, the fertile solitary, on long peduncles.

Banks of streams. June, July. A slender vine, climbing over other vegetables. *Leaves* 1 to 2 inches in diameter, on petioles. *Tendrils* 5 to 6 inches long. *Flowers* yellowish, small. *Fruit* small, oval.

CULTIVATED EXOTICS.

4. MOMORDICA. Linn.

FLOWERS monœcious. CALYX 5-cleft. PETALS 5, united at the base. STAMENS 5, triadelphous. STYLE 3-cleft; PEPO fleshy, bursting elastically. SEEDS compressed with a fleshy arillus.—*An annual climbing herb, with simple tendrils, palmately lobed leaves, and pale yellow flowers.*

M. BALSAMINA, L. *Common Balsam Apple.*

Leaves palmately 5-lobed, dentate, naked, shining; *peduncles* solitary, filiform, 1-flowered, with an orbicular-cordate dentate *bract* above the middle; *fruit* roundish-ovoid, angular, tuberculate, bursting elastically on one side. Native of the East Indies. *Stem* slender, climbing by simple tendrils. *Flowers* pale-yellow. *Fruit* orange-color, balsamic and eatable.

5. CUCUMIS. Linn.

Celtic, *cuce*, a hollow vessel.

FLOWERS monœcious or perfect. CALYX tubular, bell-shaped, with awl-shaped segments; COROLLA deeply 5-parted. STAMENS 5, triadelphous. STYLE short; STIGMAS 3, thick, 2-lobed; PEPO fleshy, indehiscent. SEEDS ovate, flat, acute and not margined at the edge.—*Annual herbs, creeping or climbing by tendrils, alternate leaves, and axillary solitary yellow flowers.*

1. C. SATIVUS, L. *Common Cucumber.*

Stem prostrate, rough; *tendrils* simple; *leaves* sub-cordate, palmately 5-angled or lobed, *lobes* sub-entire, acute, terminal one longest; *fruit* oblong, obtusely prismatic, prickly on a short peduncle. Native of Tartary and India. Numerous varieties are now cultivated for the table. Gathered and eaten before maturity. June—Sept.

2. C. MELO, L. *Musk Melon.*

Stem prostrate, rough; *tendrils* simple; *leaves* sub-cordate, roundish, obtuse, palmately 5-angled; *lobes* rounded, obtuse, obscurely denticulate; *flowers* pistillate, perfect, and staminate, the perfect on short peduncles; *fruit* oval or sub-globose, longitudinally torulose. Native of Asia, cultivated for the juicy, yellowish, delicately flavored flesh of the mature fruit. June, July.

3. C. ANGURIA, L. *Prickly Cucumber.*

Stem prostrate, slender, hisped; *tendrils* simple; *leaves* palmately and deep sinnate lobed, cordate at base; *fruit* oval-ovoid or sub-globose, prickly. Native of Jamaica. *Fruit* about the size of a hen's egg; cultivated and used for pickles.

4. C. CITRULLUS, Ser. *Water Melon.*

Stem prostrate, slender, hairy; *tendrils* branching; *leaves* palmately 5-lobed, very glaucous beneath; *lobes* mostly sinuate-pinnatifid, all the segments obtuse; *flowers* solitary, on hairy peduncles, bracted at base; *fruit* elliptical, smooth. Native of Africa and India. Cultivated for its large and delicious fruit. June, August.

6. LAGENARIA. Ser.

Gr. *lagenos,* a flagon or bottle; from the form of the fruit.

FLOWERS monœcious. CALYX bell-shaped, 5-toothed, obovate. STAMENS 5, triadelphous; *anthers* very long, twisted. STIGMAS 3, thick, 2-lobed, sub-sessile. PEPO woody, 1-celled many-seeded; *seeds* ariled, obcordate, compressed, margin tumid.—*An annual herbaceous plant, climbing by branching tendrils, with axillary solitary, white flowers.*

L. VULGARIS, Ser. *Calabash. Bottle Gourd.*

Softly pubescent; *leaves* roundish-cordate, abruptly acuminate, denticulate, with 2 glands beneath at base; *flowers* on peduncles; *fruit* club-shaped, inflated, at length smooth. Native of the Tropics; cultivated for the rind of the fruit, which is used for dipping water, &c. *Flowers* white. July, Aug.

7. CUCURBITA. Linn.

A Latin word signifying a vessel.

FLOWERS monœcious. COROLLA bell-shaped; *petals* united and coherent with the calyx. STAM. FLS. CALYX 5-toothed. STAMENS 5, triadelphous; *anthers* syngenesious, straight, parallel. PIST. FLS. CALYX 5-toothed, upper part deciduous after flowering. STIGMAS 3, thick, 2-lobed. PEPO fleshy or woody, 3 to 5-celled. SEEDS numerous, thickened at the margin, obovate, compressed, smooth.—*Annual herbs with prostrate running stems, mostly branched tendrils, and yellow solitary axilary flowers.*

1. C. PEPO, L. *Pumpkin.*

Hispid and scabrous; *leaves* (very large) cordate, palmately 5-lobed or angled, finely toothed; *flowers* axillary; *stem fls.* on long peduncles; *fruit* very large, roundish or oblong, smooth, furrowed and torulose. Native of the Levant. Long cultivated as a useful kitchen vegetable, or for cattle. *Flowers* large, yellow.

Fruit sometimes 3 feet in diameter, yellow when mature. The Barrel Pumpkin and 7-year Pumpkin are varieties of this species. July.

2. C. MELOPEPO, L. *Flat Squash, Sweet Pumpkin.*

Hairy; *leaves* cordate, somewhat palmately 5-lobed, finely toothed; *flowers* pedunculate; *fruit* depressed-orbicular or club-shaped, often elongated and incurved at base, more or less furrowed with the ridges swelling. Native country unknown. A useful and well known kitchen vegetable.

3. C. VERRUCOSA, L. *Warted Squash. Club Squash.*

Hairy; *leaves* cordate, palmately and deeply 5-lobed, denticulate, terminal lobes narrowed at base; *flowers* pedunculate, large; *fruit* roundish elliptic, or club-shaped, often elongated and curved at base. Probably a native of North America, as Mr. Nutall says it has been long cultivated by the Indians West of the Mississippi. Common in cultivation, with numerous varieties. July.

ORDER 48. CRASSULACEÆ.

Succulent herbs, with simple mostly sessile leaves, and perfectly symmetrical flowers; the petals, pistils and sepals equal (3 to 20), *and the stamens the same or double their number.* SEPALS more or less united at base. PETALS distinct, rarely cohering. OVARIES as many as the petals and opposite to them. FILAMENTS distinct. ANTHERS 2-celled, bursting lengthwise. FRUIT. *Follicles* as many as the ovaries, opening by the ventral suture, many-seeded.

1. TILLÆA. Linn.

In honor of *Tilli*, an early Italian botanist.

SEPALS, PETALS, STAMENS, and PISTILS, 3 to 4. CARPELS 3 to 4, distinct, opening by the inner suture, many-seeded.—*Very small tufted annuals, with opposite entire leaves and axillary flowers.*

T. SIMPLEX, Nutt. *Pigmy Weed.*

Stem diffusely branching from the base and rooting; *leaves* linear-oblong, their bases somewhat confluent; *flowers* solitary, nearly sessile, calyx half the length of the petals, *carpels* 8 to 10-seeded.

Muddy banks of streams; rare. Near Philadelphia. July, Aug. *Stems* 1 to 3 inches long, *Leaves* ⅛ to ¼ inch long, spreading. *Flowers* very minute, white.

2. SEDUM. Linn.

Lat. *sedeo*, to sit; alluding to the manner in which these plants fix themselves upon rocks and walls.

SEPALS and PETALS 5, rarely 4. STAMENS 10, or rarely 8. CARPELS 5, many-seeded, with a little scale at the base of each.—*Mostly herbaceous thick-leaved perennials, with cymose flowers.*

1. S. TERNATUM, Michx. *Three leaved Stone-crop.*

Stems low and spreading; *lower leaves* whorled in threes, wedge-obovate; *upper* *leaves* oblong, scattered; *cymes* mostly 3-spiked, spreading; *terminal flowers* decandrous, the rest octandrous; *stamens* shorter than the linear-lanceolate petals.

Rocky woods; sometimes cultivated. May, June. *Stems* 3 to 8 inches long, branching and decumbent at base. *Leaves* from ½ to 1 inch long. *Flowers* white, loosely arranged on the 3-branched spreading cymes.

2. S. TELEPHOIDES, Michx. *American Orpine.*

Stems erect, leafy at the top; *leaves* scattered, lance-ovate or oval, flat, acute at each end, somewhat toothed, smooth and fleshy; *flowers* in a terminal capitate cyme, decandrous; *petals* ovate-lanceolate.

Rocks: Allegheny mountains. July. *Stem* branching, 10 to 12 inches high. *Leaves* 1 to 2 inches long, ⅔ as wide. *Flowers* pale purple, with leafy bracts interspersed.

3. S. TELEPHIUM,. L. *Common Orpine. Live-forever.*

Stems erect, leafy to the top; *leaves* flat, oval, obtuse, serrate, tapering at the base; *cymes* dense, compound. Native of Europe, cultivated and nearly naturalized. July. *Stems* 1 to 2 feet high, simple, leafy, round, smooth, purplish. *Leaves* sessile, fleshy. *Flowers* white and purple, in dense terminal leafy tufts.

4. S. ANACAMPSEROS, L. *Evergreen Stone-crop.*

Root fibrous; *stems* decumbent; *leaves* wedge-form, tapering at the base; *cymes* corymbose, leafy. Native of Europe. July. *Stems* reddish. *Leaves* fleshy, bluish-green. *Flowers* purple.

5. S. ACRE, L. *English Moss. Wall Pepper.*

Procumbent, spreading, branching from the base; *leaves* very small, somewhat ovate, fleshy, crowded, alternate, closely sessile, obtuse; *cyme* few-flowered, trifid, leafy. Native of Great Britain. Common in cultivation, spreading very rapidly on walls, borders of flower beds, &c., densely covering the surface. *Flowers* yellow.

PENTHORUM. Gron.

Gr. *pente*, five, and *oras* a rule or mode; in allusion to the quinary flowers.

SEPALS 5, united at base. PETALS 5, or none. STAMENS 10. PISTILS 5, united at the base so as to form a 5-angled, 5-horned and 5-celled capsule, which opens transversely on the inner sides of the beaks. SEEDS numerous, minute.—*Upright perennials, with scattered leaves, and yellowish-green flowers loosely-spiked along the upper side of the naked branches of the scorpoid cyme.*

P. SEDOIDES, L. *Ditch Stone-crop.*

Stem branched, angular above; *leaves* alternate, lanceolate, acute at both ends unequally serrate.

Ditches and overflowed grounds; common. Aug., Sept. *Stem* 12 to 15 inches high. *Flowers* pale yellowish-green.

ORDER 49. **SAXIFRAGACEÆ.**

Herbaceous or shrubby plants, with alternate leaves, and simple flower stems (often aked*).* CALYX free or more or less adherent to the ovary, superior or inferior, 4 o 5-cleft. PETALS 5, rarely none. STAMENE 5 to 10, inserted either into the calyx or beneath the ovary. OVARY 1 or 2-celled. STYLES none. STIGMAS sessile, on the tips of the lobes of the ovary. FRUIT a capsule or berry with numerous small seeds.

SUB-ORDER I. SAXIFRAGEÆ.

Herbs; the petals imbricated (rarely convolute) *in the bud; capsule 2-beaked; calyx free or partly adherent; petals* 5 (rarely 4 to 6).

SAXIFRAGA. Linn.

Lat. *saxum*, a rock, and *frago*, to break; in allusion to the root penetrating the crevices of rocks and stones.

CALYX deeply 5-cleft. PETALS 5, entire, with short claws. STAMENS 10. STYLES 2. CAPSULE 2-beaked, 2-celled, many-seeded, opening between the beaks or sometimes 2 almost separate follicles.—*Chiefly perennial herbs, with clustered root-leaves, the stem leaves alternate, and yellow white and greenish flowers.*

1. S. VIRGINIENSIS, Michx. *Virginian Saxifrage.*

Pubescent; *leaves* obovate or spatulate-obovate, often obtuse crenate-dentate, tapered at the base into a broad petiole; *flowers* in a clustered cyme which at length becomes open and loosely panicled; *petals* oval, twice as long as the calyx; *capsules* 2, united at the base, divergent.

Exposed rocks and hilly places; common. April—June. *Scape* 4 to 12 inches high. *Leaves* in a radical spreading tuft. *Flowers* white, with a tinge of purple. A well known and pretty species, flowering in early spring.

2. S. PENNSYLVANICA, Linn. *Swamp Saxifrage.*

Pubescent; *leaves* oblanceolate or oval, narrowed at the base into a short and broad petiole, obscurely toothed; *cymes* in a large oblong panicle, at first clustered; *flowers* pedicellate; *petals* lance-linear, about the length of the nearly free recurved calyx lobes; *filaments* awl-shaped.

Wet grounds; common. May, June. A homely species 1 to 3 feet high. *Leaves* 4 to 8 inches long, all radical. *Flowers* small, greenish-yellow. *Capsules* at length divergent.

2. S. EROSA, Pursh. *Lettuce Saxifrage.*

Leaves all radical oblong or oblanceolate, obtuse, sharply-toothed, tapering into a short winged petiole; *scape* slender; *panicle* elongated, loosely flowered; *pedicels* slender; *calyx* reflexed, 3-nerved, free from the ovary nearly as long as the oval obtuse petals; *filaments* club-shaped.

Cold mountain brooks, near Bethlehem. *Mr. Wolle.* June. *Root* fibrous. *Stem* 12 to 30 inches high. *Leaves* 8 to 12 inches long. *Petals* small, white, with a yellowish spot near the base.

2. HEUCHERA. Linn.

In honor of *John Henry Heucher*, a German botanist.

CALYX bell-shaped, cohering at the base with the ovary, 5-cleft. PETALS 5, spatulate, small, entire, erect. STAMENS 5, inserted alternately with the petals into the throat of the calyx. STYLES 2. CAPSULE 1-celled, with 2 parietal many-seeded placentæ, 2-beaked, opening between the beaks.—*Perennial herbs, with round heart-shaped radical leaves, and greenish-white tinged with purple flowers in small clusters disposed in a prolonged mostly loose panicle.*

1. H. Americana, L. *Alum Root.*

Hairy-pubescent and somewhat visced; *lobes* of the leaves short and rounded; *panicle* loose; *stamens* at length much exserted.

Rocky woodlands; common. June, July. *Scape* 2 to 3 feet high, somewhat clammy hairy. *Leaves* deeply cordate. *Flowers* small, in a long simple panicle.

2. H. pubescens, Pursh. *Pubescent Alum Root.*

Scape naked, minutely glandular pubescent, or smooth below, often 2 to 4-leaved; *leaves* orbicular-cordate; *lobes* rounded, sharply-toothed, with broad pointed teeth, ciliate with bristly hairs; *flowers* in a contracted panicle; *stamens* shorter than the erect lobes of the calyx.

Mountains and hills. May, June. *Scape* 10 to 15 inches high, slender. *Flowers* nearly ½ inch in length. *Calyx-lobes* unequal, greenish-white. *Petals* violet-purple, veiny.

3. MITELLA. Tourn.

A diminutive of the Latin *mitra*, a mitre or cap; in allusion to the form of the capsule.

Calyx short, bell-shaped, coherent with the base of the ovary, 5-cleft. Petals 5, inserted into the calyx, slender, pinnatifid. Stamens 10, included. Styles 2, very short. Capsule short, 2-beaked, 1-celled, 2-valved; *valves* equal. Seeds numerous.—*Low and slender perennial herbs, with round heart-shaped leaves on slender petioles, those of the scape opposite, flowers small, greenish and white, borne in a simple slender raceme or spike.*

1. M. diphylla. L. *Two-leaved Bishop's-Cap.*

Radical leaves heart-shaped, acute, somewhat 3 to 5-lobed, toothed; *scape leaves* 2, opposite, nearly sessile; *flowers* in a terminal raceme; *petals* toothed-pinnatifid.

Hillsides and rich woods. May. *Stem* 8 to 12 inches high. *Radical leaves* on long petioles. *Scape* many-flowered. *Flowers* small, white, in a *raceme* 4 to 8 inches long. *Plant* hairy. *Two-leaved Mitre-wort.*

2. M. nuda, L. *Heart-leaved Bishop's-Cap.*

Stem slender; *radical leaves* somewhat 3-lobed, deeply and doubly-crenate; *scape* naked, or with a single leaf, few-flowered; *petals* fimbriate-pinnatifid.

Deep moist woods with mosses. May—July. *Scape* 4 to 8 inches high, occasionally prostrate with creeping suckers. *Root-leaves* on long petioles; *stem leaves* much smaller and sessile. *Flowers* greenish-white, few, in a terminal spike.

4. TIARELLA. Linn.

A diminutive of the Latin *tiara*, a head dress; in allusion to the form of the capsule.

Calyx 5-parted, bell-shaped, nearly free from the ovary.

PETALS 5, with claws, entire, inserted into the calyx. STAMENS 10, long and slender. STYLES 2, distinct. CAPSULES 1-celled, 2-valved; *valves* unequal. SEEDS few, globular near the base of the capsule.—*Perennial herbs, with radical cordate leaves and white flowers.*

T. CORDIFOLIA, L. *False Mitre-wort.*

Scape naked; *leaves* arising from the root-stock or runners, heart-shaped, acutely lobed and toothed, slightly hairy above, downy beneath.

Rich rocky woods. April, May. *Leaves* on long petioles. *Scape* 6 to 12 inches high. *Flowers* white, in a simple terminal raceme. A handsome plant in flower

5. CHRYSOSPLENIUM. Tourn.

Gr. *krusos*, golden, and *splen;* in allusion to its supposed medicinal virtues.

CALYX-TUBE coherent with the ovary, the *limb* 4 to 5-parted, *lobes* obtuse, yellow within. PETALS none. STAMENS 8 to 10, very short. STYLES 3. CAPSULE obcordate, 2-beaked, flattened, 1-celled, 2-valved at the top. SEEDS numerous.—*Low and smooth herbs growing in wet places, with fleshy leaves, and small solitary or leafy-cymed flowers.*

C. AMERICANUM, Schwein. *Amer. Golden Saxifrage.*

Stem decumbent, slender, spreading, forked; *leaves* opposite, upper ones sometimes alternate, roundish-ovate, slightly crenate lobed; *flowers* distant, inconspicuous, nearly sessile.

Springs and brooks. April, May. An inconspicuous succulent creeping plant with small greenish flowers. *Stamens* mostly 8, hisped; *anthers* orange-color. Considered distinct from the European C. oppositifolium.

SUB-ORDER II. ESCALLONIEÆ?

Shrubs; leaves alternate; petals valvate in the bud.

6. ITEA. Linn.

The Greek name of the willow; from a resemblance of foliage.

CALYX companulate, 5-cleft, free from the ovary; *segments* subulate. PETALS 5, lanceolote, much longer than the calyx and stamens. STAMENS 5, inserted into the calyx. STYLES 2, united. CAPSULE 2-celled, 2-grooved, 8 to 12-seeded.—*A shrub, with alternate simple and minutely serrate leaves, and white flowers in simple spicate terminal racemes.*

1. I. VIRGINICA, L.

Leaves oval acuminate serrulate, on short petioles; *capsules* oblong, acuminate tipped with the 2 united styles.

Margins of swamps. May, June. A shrub about 3 to 8 feet high.

SUB-ORDER III. HYDRANGEÆ.

Shrubs; leaves opposite; petals valvate in the bud; calyx-tube coherent with the ovary.

7. HYDRANGEA. Gronov.

Gr. *hudor*, water, *aggion*, a vase; in allusion to the form of the capsule.

CALYX-TUBE hemispherical, 8 to 10-ribbed, adherent to the ovary; *limb* 4 to 5-toothed, persistent. PETALS ovate, sessile. STAMENS 8 to 10, slender. STYLES 2. CAPSULE 2-celled, many-seeded, crowned with the 2 diverging styles, opening by a hole between the styles.—*Shrubs with opposite petioled leaves and numerous flowers in compound cymes. The margined flowers are often sterile and radient.*

1. H. ARBORESCENS, L. *Wild Hydrangea.*

Leaves ovate, obtuse, or cordate at base, pointed, serrate, nearly smooth; *flowers* in fastigiate cymes.

A handsome shrub, native along the banks of the Susquehanna, flowering in June. *Stem* 5 to 6 feet high. *Fertile flowers* small, white, yellowish or roseate, very numerous. In cultivation, the marginal flowers become radiate.

2. H. QUERCIFOLIO, Bartram. *Oak-leaved Hydrangea.*

Leaves deeply sinuate-lobed, dentate, tomentose beneath. *Cymes* paniculate, radiant; the *sterile flowers* very large and numerous. Native of Florida. A handsome shrub from 3 to 5 feet high, with very large leaves, and showy flowers at first a dull white becoming reddish.

3. H. HORTENSIS, L. *Changeable Hydrangea.*

Leaves elliptical, crowned at each end, dentate-serrate, strongly veined, smooth. *Cymes* radiant. *Flowers* mostly radiant. Native of China. This beautiful species has long been cultivated for its showy flowers which are at first green but pass successively through straw-color, white, purple and pink. The var. *H. Japonica* has the central flowers all fertile, bluish-purple, hardy about Philadelphia.

SUB-ORDER IV. PHILADELPHEÆ.

Shrubs: leaves opposite; petals convolute in æstivation; capsule 3 *to* 4*-celled, loculicidal.*

8. PHILADELPHUS. Linn.

Name from *Philadelphus*, King of Egypt.

CALYX 4 to 5-parted, half-superior, persistent. COROLLA 4 to 5-petalled. STYLE 4-cleft. STAMENS 20 to 40, shorter than the petals. CAPSULE 4-celled, 4-valved, with loculicidal dehiscence. SEEDS many, ariled.—*Shrubs, with opposite exstipulate leaves and showy white flowers.*

1. P. GRANDIFLORUS, Willd. *Large-flowered Syringa.*

Leaves ovate, acuminate, denticulate, 3-veined, axils of the veins hairy. *Stigmas* 4, linear. *Style* undivided. A handsome shrub 4 to 8 feet high, with long slender branches. Native at the South, cultivated for its large showy white flowers, which are borne in a terminal umbel of 2 or 3 together.

2. P. CORONARIUS, L. *False Syringa.*

Leaves ovate, sub-dentate, smooth. *Style* distinct. Cultivated. Native of South Europe. *Stems* 4 to 6 feet high with opposite reddish twigs bearing leafy clusters of numerous fragrant showy white flowers.

ORDER 50. **HAMAMELACEÆ.**

Shrubs with alternate simple leaves, the 4-cleft calyx cohering with the base of the ovary. PETALS 4 to 5, linear. STAMENS 4 to 24, inserted on the calyx; *ovary* consisting of 2 pistils united at the base, forming a 2-beaked woody capsule opening at the summit, 2-celled below, with a single pendulous bony seed in each cell.

HAMAMELIS. Linn.

Origin of the name uncertain.

CALYX 4-leaved or cleft, with 2 or 3 bractlets at its base. PETALS 4, long, linear. STAMENS 8, very short; the 4 alternate with the petals fertile, the other imperfect and scale-like. STYLES 2, short. CAPSULE nut-like, 2-celled, 2-beaked.—*Shrubs or small trees, with short-petioled straight-veined leaves, and yellow flowers.*

H. VIRGINICA, L. *Witch Hazel.*

Leaves obovate or oval, with wavy-toothed margins, downy when young, on short petioles; *flowers* sessile, 3 or 4 together.

Damp woods; common. A large shrub consisting of several crooked branching trunks from the same root, 6 to 12 feet high, flowering in Oct. and Nov. *Leaves* nearly smooth, obliquely cordate at base. 3 to 5 inches long, 2 to 3 wide, on petioles ½ inch long. *Calyx* downy. *Petals* yellow, curled or twisted. *Capsule* woody, containing 2 nuts.

ORDER 51. **UMBELLIFERÆ.**—*Parsley Family.*

Herbaceous plants with hollow stems, alternate, mostly compound leaves, petioles expanded or sheathing at the base. FLOWERS in umbels, the calyx entirely adherent to the ovary, the 5 petals and 5 stamens inserted on the disk that crowns the ovary and surrounds the base of the 2 styles. FRUIT consisting of 2 coherent carpels separating from each other by their faces (commissure) into 2 halves called mericarps. SEEDS solitary and suspended from the summit of each cell, anatropous, with a minute embryo.

SUB-ORDER I. ORTHOSPERMÆ.

Inner face of the seed flat or nearly so (not excavated).

1. HYDROCOTYLE. Tourn. MARSH PENNY-WORT.

Gr. *huder*, water, and *kotile*, a broad or flat cup; in allusion to the leaves of some of the species.

CALYX-TEETH obsolete. PETALS equal, ovate, spreading, entire, apex straight. STAMENS 5. STYLES 2, shorter than the stamens. FRUIT laterally flattened, orbicular or shield-shaped, the commissure narrow; *carpels* 5-ribbed, two of the ribs enlarged, often forming a thickened margin.—*Low and smooth aquatic perennials, with slender stems, round peltate or kidney-form leaves, and small white flowers in simple umbels or clusters, single or proliferous.*

1. H. AMERICANA, L. *American Marsh Penny-wort.*

Smooth and shining; *leaves* round, kidney-form, doubly crenate, slightly-lobed; *flowers* in sessile umbels, 3 to 5-flowered; *fruit* orbicular.

Moist shady places. June, July. Small delicate plants, with filiform, branching stems 2 to 6 inches long, sending out running suckers. *Leaves* thin, 1 to 2 inches in diameter on petioles 2 to 3 inches long. *Flowers* greenish-white, small, in very small axillary umbels.

2. H. RANUNCULOIDES, L. *Lobed Marsh Penny-wort.*

Smooth; *leaves* round-kidney-form, 3 to 5-nerved, the lobes crenate; *umbels* 8 to 10-flowered; *pedicels* very short; *fruit* roundish, smooth, scarcely ribbed.

In water. June, July. *Stems* weak, 1 to 2 feet long, creeping or floating. *Leaves* mostly deeply 3-lobed, the middle lobes smaller than the other, 1 to 2 inches in diameter, on petioles 2 to 3 inches long. *Flowers* white on peduncles shorter than the petioles.

3. H. INTERRUPTA, Muhl.

Smooth; *stem* filiform; *leaves* peltate, orbicular, crenate, 11-nerved; *umbels* capitate, subsessile, 5 to 8-flowered; *fruit* orbicular.

Wet places; rare. June—Aug. *Stem* and *root* creeping. *Leaves* almost centrally peltate, ½ to 1 inch in diameter, on petioles 2 to 3 inches long. *Peduncles* about as long as the leaves, bearing clusters of a few sessile flowers, interruptedly along its length. *Flowers* small, white, on very short pedicels. *Fruit* notched at the base.

4. H. UMBELLATA, L. *Umbellate Penny-wort.*

Smooth; *stems* rooting at the joint; *leaves* peltate in the middle, orbicular, notched at the base, doubly crenate; *umbel* many-flowered on an elongated peduncle.

Ponds and boggy places; rare. June—Aug. *Stem* creeping or floating, 2 to 4 inches long. *Leaves* on petioles 2 to 4 inches long, ¾ to 1 inch wide. *Umbels* 20 to 30-flowered, the upper pedicel often proliferous with 2 or 3 umbels. *Flowers* small. *Fruit* notched at the base and apex.

2. CRANTZIA. Nutt.

In honor of *Prof. Crantz*, an Austrian botanist of the 18th century.

CALYX-TEETH indistinct. PETALS roundish, entire, obtuse. FRUIT roundish; the carpels hollowed on the inner face, 5-ribbed, 3 of the ribs on the back, narrow, the lateral ones thickened and spongy.—*Small perennial creeping plants, with linear or filiform, entire fleshy leaves, and few flowers on simple involucrate umbels.*

C. LINEATA, Nutt.

Leaves cuneate-linear, obtuse, with transverse veins, shorter than the peduncles.

Muddy banks of streams. July. *Stem* 1 to 2 inches long, rooting and creeping in the mud. *Leaves* 1 to 2 inches long, nearly terete. *Umbels* 4 to 8-flowered. *Flowers* white, pedicelled. *Fruit* with red vittæ.

3. SANICULA. Linn.

Lat. *sano*, to *heal;* on account of its supposed medicinal virtues.

Calyx-tube beset with prickles, segments acute, leafy, persistent. Petals obovate, erect, converging, deeply notched. Fruit sub-globose, thickly clothed with hooked prickles; *carpels* without ribs.—*Perennial herbs, with palmately-lobed or parted leaves, those of the root long-petioled; umbels irregular or compound, the greenish or yellowish flowers capitate in the umbellets, perfect, with staminate ones intermixed, and involucre of few often cleft leaflets, involucel of several, entire.*

1. S. Marilandica, L. *Sanicle.*

Leaves 5 to 7-parted, mostly radical, segments oblong, incisely serrate; *sterile flowers* numerous, on slender pedicels, about as long as the fertile ones; *styles* long and recurved.

Woods and thickets; common. June, July. *Stem* 1 to 2 feet high, branching at the top. *Radical leaves* on petioles ½ to 1 foot long, 3-parted at the base, with the lateral segments deeply 2-parted. *Stem leaves* few, nearly sessile. *Petals* white or yellowish, obcordate. *Fruit* several in each umbellet.

2. S. Canadensis, L. *Canadian Sanicle.*

Leaves 3 to 5-parted, the segments incisely and sharply serrate; *sterile flowers* few, on very short pedicels, shorter than the fertile ones; *styles* shorter than the prickles of the fruit.

Woods. June, July. *Plant* 1 to 2 feet high. *Leaves* thin, divisions wedge-obovate or oblong, sharply cut and serrate (the upper ones only 3-parted). *Fruit* about 3 in each umbellet.

4. DAUCUS. Tourn. Carrot.

(The ancient Greek name.)

Calyx 5-toothed. Petals obovate, emarginate with an inflexed point. Fruit ovoid or oblong, the carpels with 5 primary, slender, bristly ribs, 2 of which are on the inner face, and 4 secondary ones, (equal, more or less winged,) each bearing a single row of slender bristly prickles.—*Biennials, with finely 2 to 3-pinnate or pinnatifid leaves, pinnatifid involucre, involucels of entire or 3-cleft bracts, white flowers, and concave umbels, dense in fruit.*

D. Carrota, L. *Carrot.*

Stem erect, hispid; *leaves* tri-pinnate; *leaflets* pinnatifid; *segments* linear-lanceolate, acute.

Old fields and roadsides; naturalized. July—Sept. *Root* fusiform. *Stem* 2 to 3 feet high. *Leaves* pale-green, numerous. *Umbels* large and compact, concave in fruit, resembling a bird's nest. *Flowers* white or cream-color, central one of each umbellet abortive and dark-purple.

5. HERACLEUM. Linn. Cow Parsnip.

Dedicated to *Hercules*.

Calyx 5-toothed, *teeth* minute. Petals obovate, emarginate, with the point inflexed. Fruit compressed, flat, with a broad, flat margin, and 3 obtuse dorsal ribs to each carpel; intervals with short club-shaped oil-tubes.—*Stout perennials, with large sheathing petioles, large flat umbels, deciduous involucres, and many-leaved involucels.*

H. LANATUM, Mich. *Cow Parsnip.*

Pubescent; *stem* grooved; *leaves* 1 to 2-ternately compound; *leaflets* petioled, round cordate, lobed; *fruit* nearly orbicular.

Moist cultivated grounds. June. A very large coarse looking strong scented plant 4 to 8 feet high. *Stems* thick, furrowed, branching. *Leaves* large, on broad channelled membranaceous petioles. *Flowers* white, in very large terminal umbels, sometimes 1 foot in diameter. *Petals* inversely heart-shaped, the outer commonly larger and radiant, appearing 2-cleft.

6. PASTINACA. Tourn. Parsnip.

Lat. *pastus*, food or repast; from the nutritive properties of the root.

Calyx with the margin obsolete or minutely 5-toothed. Petals roundish, entire, involute. Fruit oval, flat, with a thin entire winged margin; the *carpels* minutely 5-ribbed, 3 of the ribs equi-distant on the back, the lateral ones distant from and contiguous to the margin.—*Chiefly biennial plants, with spindle-shaped roots, pinnately compound leaves, yellow flowers with roundish entire petals, none radient, and small or no involucres or involucels.*

P. SATIVA, L. *Common Parsnip.*

Stem grooved, smooth; *leaves* pinnate; *leaflets* sessile, oblong, incised; *terminal ones* 3-lobed, downy beneath, shining above; *umbels* large, terminal.

Fields and waste places; naturalized. July. *Root* large, sweet-flavored, and nutritious in its cultivated state, but in its wild state becomes hard, acrid and poisonous. *Stem* 2 to 3 feet high, erect, furrowed, branching. *Flowers* small, yellow. *Fruit* large, flat.

7. ARCHANGELICA. Hoffman.

So named from its highly esteemed qualities.

Calyx-teeth short. Petals lanceolate, equal, entire, acuminate, point inflexed. Fruit flattened, the carpels each 3-ribbed on the back and winged at the margins, forming a double winged border to the point; the *seeds* separating, and coated all over with the numerous oil-tubes.—*Stout and often very large perennials, with* 1 *to* 2-*pinnately compound leaves, and usually large inflated petioles, scarcely any involucre, many-leaved involucels and perfect umbels of greenish or white flowers.*

1. A. ATROPURPUREA, Hoffm. *Great Angelica.*

Smooth; *leaves* 2 to 3-ternately compound; the *leaflets* pinnate, 5 to 7, sharply cut serrate, acute, pale beneath; *petioles* much inflated; *involucels* 8 to 10, very short; *fruit* smooth.

Meadows and fence rows; common. July, Aug. *Stem* 3 to 6 feet high, stout, hollow, dark-purple, furrowed. *Petioles* large, inflated, channelled on the upper side, with inflated stipules at base. *Umbels* 3, terminal, rounded, 4 to 8 inches in diameter. *Flowers* greenish white. A popular aromatic herb.

2. A. HIRSUTA, Torrey & Gray. *Hirsute Angelica.*

Stem striate, downy at the top; *leaves* twice pinnately or ternately divided; *leaflets* ovate-oblong, equally serrate, smooth; *involucels* of 6 to 8 subulate leaves directed to one side; *peduncles* and *fruit* downy.

Dry open woods. July, Aug. *Stem* 2 to 5 feet high, simple, erect, straight. *Leaves* on petioles 6 to 10 inches long. *Umbels* 3 to 4, on long velvety peduncles. *Flowers* numerous, white.

8. THASPIUM. Nutt. MEADOW PARSNIP.

From the Isle of *Thaspia,* which gave name to the ancient allied genus Thapsia.

CALYX minutely 5-toothed. PETALS elliptic, with a long inflated point. FRUIT elliptical or ovoid, not compressed laterally; *carpels* with 5 winged ribs, interstice with single vittæ. INVOLUCRE none.—*Perennials with* 1 *to* 4 *ternately compound leaves, and yellow or dark-purple flowers.*

1. T. BARBINODE, Nutt. *Hairy-jointed Thaspium.*

Leaves 2 to 3 ternately compound; *leaflets* wedge-ovate, acute, unequally and incisely serrate, entire towards the base; *umbels* terminal and opposite the leaves.

River banks, Northern part of the State. June. *Stem* tall and branching, downy on the joints, 2 to 3 feet high. *Leaves* smooth; *upper ones* sub-opposite. *Flowers* deep yellow, numerous.

2. T. AUREUM, Nutt. *Golden Thaspium.*

Stem smooth; lower and middle *stem leaves* biternately, and the upper ones ternately divided; *segments* oblong-lanceolate, finely serrate, with cartilaginous teeth, the root-leaves often simple and round heart-shaped; *fruit* oval.

Banks and moist meadows. June. *Stem* 1 to 3 feet high, simple. *Leaflets* very smooth, thickish; the larger often heart-shaped, the upper wedge-shaped at the base. *Umbels* on long peduncles 10 to 12-rayed, with very short involucres. *Flowers* yellow. *Fruit* oval.

3. T. ATROPURPUREUM, Nutt. *Purple Alexanders.*

Stem smooth or slightly pubescent; *root-leaves* simple and heart-shaped, sometimes ternate, serrate; *stem leaves* ternate; *leaflets* heart-ovate and oblong-ovate, crenate-serrate, Rocky hills and woods. *Stem* 1 to 2 feet high. *Flowers* dark purple. *Fruit* strongly winged, as broad as long.

9. ZIZIA. Koch. GOLDEN ALEXANDERS.

In honor of *J. B. Zizie,* a German botanist.

CALYX minutely 5-toothed. PETALS elliptic, apex acuminate, inflexed. FRUIT ovate or oval, flattened, didymous; CARPELS 5, ribbed, without wings; *ribs* narrow; *vittæ* 1 to 3 in each interstice.—*Smooth perennials, with divided leaves, no involucre, few-leaved involucels, and perfect umbels of yellow flowers.*

1. Z. CORDATA, Koch.

Root-leaves simple, cordate, rarely lobed, crenate-serrate; *stem-leaves* sub-sessile, ternate, segments petiolate, ovate or oblong, serrate.

Meadows; common. May, June. *Stem* 12 to 18 inches high, smooth. *Root-leaves* sometimes slightly lobed. *Involucels* 1 to 2-leaved. *Umbels* on long naked peduncles. *Flowers* yellow. *Fruit* short, oval, black.

2. Z. AUREA, Koch.

Lower leaves biternate; *upper ones* biternate or ternate; *segments* oblong-lanceolate, acute, sharply serrate and often cut, the *end ones* attenuate into a wedge-form base or winged stalk; *involucels* 3-leaved.

Rocky hills, woods and river sides. June, July. *Stem* 1 to 2 feet high, branching at the top, rather slender, erect, hollow, smooth. *Lower leaves* on long petioles. *Umbels* about 2 inches broad, 10 to 15 rayed. *Flowers* numerous, orange-yellow. *Fruit* oval, brown, with prominent ribs.

3. Z. INTEGERRIMA, DC.

Leaves all 2 to 3-ternately divided; *segments* ovate or oblong, entire, obtuse, smooth and glaucous; *involucels* 1-leaved, very short.

Rocky woods; rare. May, June. *Stem* 1 to 2 feet high, branching above. *Leaves* all petiolate, pale beneath. *Umbel* with elongated filiform rays 1 to 3 inches long, with minute involucels. *Flowers* yellow. *Fruit* roundish, compressed laterally, dark brown.

10. CICUTA. Linn. WATER HEMLOCK.

(The ancient Latin name of Hemlock.)

CALYX minutely 5-toothed. PETALS obcordate, the points inflected. FRUIT roundish, a little contracted at the sides; *carpels* with 5 flattish strong ribs; the lateral ones margined; interstice with single vittæ.—*Smooth marsh perennials, with hollow stems, thrice pinnately or ternately compound leaves, few-leaved involucre, many-leaved involucels, and perfect umbels of white flowers.*

1. C. MACULATA, L. *Water Hemlock.*

Lower leaves triternate and quinate; *upper ones* biternate, segments oblong-lanceolate, coarsely serrate; *umbels* terminal and axillary.

Wet meadows; common. July, Aug. *Stem* 3 to 6 feet high, streaked with purple, smooth, jointed, glaucous, branched above. *Petioles* dilated at base into long abrupt clasping stipules. *Leaflets* 1 to 3 inches long, ¼ to ¾ wide, sometimes lobed, pointed. *Umbels* numerous, 2 to 4 inches broad. Poisonous.

2. C. BULBIFERA, L. *Bulbous Hemlock.*

Leaves ternate and biternate; *leaflets* linear, remotely toothed or cut-lobed; upper axils bearing bulbs; *umbels* terminal and axillary, small.

Wet meadows and swamps; rare. Aug. *Stem* 2 to 4 feet high, round, smooth and slender, striate, green, branching. *Involucels* of 3 to 5 subulate leaves. *Umbellets* of small, close, white flowers.

11. SIUM. Linn. WATER PARSNIP.

Celtic *siu*, water; in allusion to its place of growth.

CALYX with the margin 5-toothed or obsolete. PETALS obcordate, with an inflexed point. STYLES divergent, reflexed. FRUIT ovate or globular, flattish or contracted at the sides; *carpels* with 5 rather obtuse ribs; interstice with several vittæ.—*Marsh or aquatic perennials, with grooved-angled stems; simply pinnate leaves, lanceolate serrate leaflets (immersed ones cut into capillary divisions); several-leaved involucres, and perfect umbels of white flowers.*

1. S. LATIFOLIUM, L. *Water Parsnip.*

Stem angular and sulcate; *leaflets* broadly lanceolate, pointed serrate, sessile smooth, sometimes pinnatifid.

Swamps. July—Sept. A tall plant found in ditches and swamps. *Stem* 3 to 5 feet high, smooth, hollow, about 7-angled. *Leaflets* 7 to 11, 4 to 7 inches long, 1 to 2 broad, equally serrate. *Petioles* clasping the stem. *Umbels* long, with many-flowered rays. *Flowers* small, white.

2. S. LINEARE, Michx. *Narrow-leaved Water Parsnip.*

Leaflets narrowly lanceolate or linear, finely and sharply serrate, acute; *calyx-teeth* obsolete.

Swamps; more common than the last. July. Aug. *Stem* 2 to 4 feet high, smooth, about 7-angled. *Leaflets* 9 to 11, 2 to 4 inches long, ¼ to ⅓ wide. *Involucre* of 5 or 6 linear bracts. *Umbellets* with numerous small white flowers. *Fruit* very strongly ribbed, crowned with the broad, yellowish stylopodium.

12. CRYPTOTÆNIA. DC. HONEWORT.

Gr. *kruptos*, hidden, and *tainia*, a fillet, from the concealed vittæ.

CALYX with the margin obsolete. PETALS obovate, with an inflexed point. FRUIT oblong, contracted at the sides; *carpels* equally 5-ribbed; *vittæ* very slender, one in each interstice, and one under each rib.—*A perennial smooth herb, with thin 3-parted lobed and toothed leaves; no involucre, few-leaved involucels, compound umbels with very unequal rays, and white flowers.*

C. CANADENSE, DC. *Canadian Honewort.*

Leaflets rhomboid-ovate, distinct, entire or 2 to 3-lobed, doubly serrate, lateral ones oblique at base.

Rich moist woods. June—Sept. *Stem* erect, 1 to 2 feet high, branched above. *Leaflets* 3, 2 to 3 inches long, 1 to 2 wide. *Petioles* clasping, 2 to 6 inches long. *Umbels* numerous, paniculate, the lower ones rising from the axils of the upper leaves. *Flowers* small, white. *Fruit* oblong beaked with the persistent style.

13. ARCHEMORA. DC. COWBANE.

A fanciful name given by DeCandolle in allusion to *Archemarus*, who is said to have died from eating parsley.

CALYX 5-toothed. PETALS obcordate, inflexed. FRUIT oval, with a broad winged margin; *carpels* with 5 sub-keeled equi-distant filiform ribs; *vittæ* one in each interstice, and 4 to 6 on the inner face.—*Smooth perennials, with rigid leaves, of* 3 *to* 9 *linear or lanceolate leaflets; scarcely any involucre; involucels of numerous small leaflets, and white flowers.*

A. RIGIDA, DC. *Rigid Cowbane.*

Stem rigid, striate, erect; *leaves* simply pinnate; *leaflets* 3 to 9, varying from lanceolate to ovate oblong, entire, or remotely toothed, in Var. AMBIGUA, linear, long and narrow.

Swamps; rare. Aug., Sept. *Stem* 2 to 4 feet high, slender. *Leaflets* 2 to 4 by ¼ to ¾ inches, varying in outline. *Umbels* 2 to 3, of many slender rays. *Petals* white. *Fruit* with sub-equal greenish ribs, and large purple vittæ filling the intervals. Poisonous.

14. BUPLEURUM. Tourn. THOROUGH WAX.

Gr. *bous*, an ox, *pleuron*, a rib; it is uncertain why so called.

CALYX-TEETH obsolete. PETALS somewhat orbicular, entire, with a closely inflexed point. FRUIT ovate-oblong, laterally flattened, or somewhat terminal; *carpels* 5-ribbed, with or without vittæ.—*Herbaceous or shrubby plants, with simple entire leaves; various involucres, and yellow flowers.*

B. ROTUNDIFOLIUM, L. *Modesty Thorough Wax.*

Leaves roundish-ovate, entire, perfoliate; *involucre* none; *involucels* of 5, ovate, mucronate bracts.

In cultivated grounds; escaped from gardens. Annual. July, Aug. *Stem* 10 to 15 inches high, branching. *Leaves* 1 to 3 inches long, ¾ as wide, rounded at base, acute at apex, very smooth. *Involucels* longer than the umbellets. *Umbels* 5 to 9-rayed. *Fruit* crowned with the wax-like shining base of the styles. *Carpels* mostly without vittæ.

CULTIVATED EXOTICS.

15. CARUM. Linn. CARAWAY.

From *Caria*, the native country of the plant.

CALYX-MARGIN obsolete. PETALS obovate, emarginate, the point inflexed. STYLES dilated at base, spreading. FRUIT oval, laterally compressed; *carpels* 5-ribbed, lateral ribs margined; intervals with single vittæ.—*Herbs with dissected leaves, perfect umbels, various involucres, and white flowers.*

C. Carvi, L. *Caraway.*

Stem 1 to 2 feet high, branched, smooth, striate. *Leaves* somewhat bipinnatifid, with numerous linear segments, lower ones large, on long petioles, with tumid, clasping sheaths. *Umbels* on long peduncles; *involucrate bract* when present linear-lanceolate. Native of Europe. Cultivated for its fine aromatic fruit.

16. APIUM. Linn.

Celtic *apon*, water; the plants grow in watery situations.

Calyx-margin obsolete. Petals roundish, with a small or narow inflexed point. Fruit roundish, laterally compressed; *carpels* 5-ribbed, the intervals with single vittæ.—*European herbs, with pinnately dissected leaves; perfect umbels and white flowers.*

1. A. graveolens, L. *Celery.*

Lower leaves pinnately dissected, on very long petioles, segments broad wedge-shaped, incised; *upper leaves* 3-parted, segments wedge-shaped, lobed and incisely dentate at apex. *Stem* 2 to 3 feet high, branching, furrowed. *Umbels* with unequal spreading rays. Native of Britain. The stems when blanched are used as a sallad. June, Aug.

2. A. petroselinum, Willd. *Parsley.*

Leaves decompound, segments of the lower ones wedge-ovate, terminal ones trifid, all incised; *cauline* segments lance-linear, sub-entire; *involucels* of 3 to 5 subulate bracts. *Stem* 2 to 4 feet high, branched. *Leaves* smooth and shining. June. Native of Sardinia and Greece. Esteemed as a pot herb.

17. PIMPINELLA. Linn. Anise.

Calyx-limb obsolete. Petals obcordate, somewhat unequal. Styles capillary as long as fruit. Fruit ovate, ribbed, with convex intervals.—*European perennial herbs, with pinnately many-parted leaves, compound umbels without involucres, and white flowers.*

P. Anisum, L. *Anise.*

Radical leaves incisely trifid; those of the stem many-cleft, with narrow-linear segments, smooth and shining. *Umbels* large, many-rayed. Native of Egypt. A well known aromatic carminative of the garden.

18. FŒNICULEM. Adans. Fennel.

Lat. diminutive of *fœnum*, hay; from the resemblance of its odor.

Calyx-margin obsolete. Petals revolute, with a broad, retuse apex. FRUIT elliptic-oblong, laterally sub-compressed; *carpels* with 5 obtuse ribs, those of the margin a little broader; intervals with single vittæ.—*Autumnal herbs, with biternately dissected leaves, no involucre or involucels, perfect umbels, and yellow flowers.*

F. VULGARE, Gart. (Anethum, Willd.) *Fennel.*

Leaves biternately dissected, segments linear subulate, elongated; *rays* of the umbel numerous, unequal, spreading; *carpels* turgid, ovate oblong. Native of England. Cultivated in gardens. *Stem* 3 to 5 feet high, round and smooth, branched. *Leaves* large and smooth, finely cleft into numerous very narrow segments. *Seeds* warmly aromatic.

SUB-ORDER II. CAMPYLOSPERMÆ.

Inner face of the seed hollowed out lengthwise, or the margins involute.

19. CHÆROPHYLLUM, Linn.

Gr. *kairo*, to gladden, and *phullon*, a leaf; alluding to the agreeable odor of the leaves.

CALYX-TEETH obsolete. PETALS obovate, emarginate, point inflexed. FRUIT laterally compressed, linear or oblong; *carpels* with 5 obtuse equal ribs, inner face deeply furrowed lengthwise, intervals with single vittæ.—*Annual or biennial plants, with bi or tri-ternate leaves, incisely cleft or toothed segments, no involucre, many-leaved involucels, and mostly white flowers.*

C. PROCUMBENS, Lam. *Wild Chervil.*

Stems slender, spreading, somewhat hairy; *segments* of the *leaves* pinnatifid, with obtuse oblong leaflets; *umbels* diffuse, few-flowered, often simple.

Moist shady places; not common. May. *Stems* 1 to 2 feet long. *Umbels* quite irregular, often with leaves in the place of the involucre. *Flowers* white.

20. OSMORHIZA. Raf. CICILY.

Gr. *osma*, a scent, and *riza*, a root; in allusion to the aromatic root.

CALYX-TEETH obsolete. PETALS oblong, nearly entire, the sharp straight point inflexed. FRUIT linear-oblong, angled, attenuated at base, contracted at the sides, crowned with the styles; *carpels* with hisped angles and 5 acute ribs, inner face with a deep bristly channel; *vittæ* none.—*Perennials, with thick aromatic roots, large 2 to 3-ternately compound leaves, few-leaved involucre and involucels, and white flowers.*

1. O. LONGISTYLIS, DC. *Sweet Cicily. Sweet Myrrh.*

Leaflets sparingly pubescent or smooth when old, short pointed, cut-toothed, sometimes lobed; *styles* slender, nearly as long as the ovary.

Rich moist woods; common. May, June. *Stem* 2 to 3 feet high, branching, purplish, nearly smooth, striate. *Leaves* mostly bi-ternate, those of the root on long petioles; *leaflets* oblong ovate. *Flowers* white, much larger than in the next. *Fruit* blackish, one inch in length, crowned with the persistent styles. *Root* with the flavor of anise.

2. O. BREVISTYLIS, DC. *Short-styled Cicily.*

Leaflets pinnatifid cut, acuminate, downy-hairy; *styles* conical, not longer than the breadth of the ovary; *fruit* somewhat tapering at the summit.

Moist rocky shady places; commoner than the last. May, June. *Stem* about 2 feet high, branching, pale-green, at length smooth. *Leaves* bi-ternate; *leaflets* incised, often pinnatifid. *Fruit* similar to the last, but crowned with convergent styles. *Root* nearly tasteless, said to be poisonous.

21. CONIUM. Linn. POISON HEMLOCK.

Konicon, the Greek name of the Hemlock by which criminals and philosophers were put to death at Athens.

CALYX-TEETH obsolete. PETALS obcordate, with an acute inflected point. FRUIT ovate, flattened at the sides; the *carpels* with 5 prominent waving ribs; inner face with a deep narrow groove; *vittæ* none.—*Biennial poisonous herbs, with large ob-compound leaves,* 3 *to* 5*-leaved involucres and involucels, and white flowers.*

C. MACULATUM, L. *Poison Hemlock.*

Stem spotted; *leaves* tri-pinnate; *leaflets* lanceolate, pinnatifid; involucels shorter than the umbellets; *fruit* smooth.

Waste places, naturalized along Chillisquaque creek, Montour county. A large branching herb, about 4 feet high, very smooth. *Stem* much branched, round, hollow, with purplish spots. *Lower leaves* very large, bright green, on long sheathing foot-stalks. *Umbels* terminal, the involucre with 5 to 8 lanceolate bracts, the involucels with the inner half wanting. *Flowers* small, white. Whole plant highly poisonous; fetid when bruised.

SUB-ORDER III. CŒLOSPERMÆ.

Seeds incurved at base and apex.

22. ERIGENIA. Nutt.

Greek *erigeneia*, a name of Aurora, the harbinger of day, or of the spring; on account of its being the first conspicuous flowering plant in the U. S. Nutt.

CALYX-TEETH inconspicuous. PETALS obovate or spatulate, flat, entire. FRUIT somewhat laterally compressed, reniform or termined with 5 very slender acute bristly ribs.—*A smooth and slender perennial, with* 2 *to* 3 *ternately divided leaves, a somewhat leafy bracted compound umbel, with white flowers.*

E. BULBOSA, Nutt. *Bulbous Erigenia.*

Alluvial soil; Western part of the State. March, April. *Root* globose, tuberous. *Stem* simple, 4 to 5 inches high, 2-leaved. *Leaves* 3-parted; divisions sub-pinnate. *Umbels* terminal, 3 to 5-flowered. *Flowers* white.

23. CORIANDRUM.

Gr. *koris*, a bug; on account of the smell of the leaves.

CALYX with 5 conspicuous teeth. PETALS obcordate, inflexed at the point; those of the outer flowers radiate, bifid. FRUIT globose; *carpels* cohering, with 5 depressed primary ribs, and 4 secondary, more prominent ones; *seeds* concave on the face.—*Smooth annuals with bi-pinnate leaves; involucre one-leaved or none, involucels 3-leaved, unilateral, and white flowers.*

C. SATIVUM, L. *Coriander.*

Leaflets on the lower leaves broad, wedge-shaped, upper with linear ones; *carpels* hemispherical. A well known plant, cultivated chiefly for its aromatic seeds. Native of Europe. *Stem* 2 feet high. *Leaves* much divided, strong scented. *Umbels* with only the partial involucre. *Flowers* white. July.

ORDER 52. ARALIACEEÆ.

Trees, herbs or shrubs, with the habit of the Umbelliferæ, but with usually 5 *to* 10 *flat petals,* 5 *to* 10 *stamens,* 2 *to* 5 *styles, and the fruit* 2 *to* 3*-celled drupes.*

1. ARALIA. Linn. SPIKENARD.

CALYX with the margin very short, 5-toothed. PETALS, STAMENS and PISTILS 5. FRUIT a berry-like drupe, 3 to 5-celled, 5-seeded, crowned with the remains of the calyx and styles.—*Low trees, shrubs or perennial herbs, with large* 2 *to* 3*-ternately or pinnately compound leaves, and panicled umbels of greenish-white flowers.*

1. A. NUDICAULIS, L. *Wild Sarsaparilla.*

Herbaceous, smooth; *stem* very short; *leaf* solitary, decompound; *leaflets* oblong-ovate or oval, pointed, serrate, 5 on each division; *scape* naked, bearing 3 umbels.

Moist rocky woods; common. May, June. *Root* large, fleshy and aromatic, running under ground several feet in length, from which arises a single leaf-stalk and scape, without a proper stem. *Scape* about 1 feet high, with 3 simple umbels of greenish flowers.

2. A. RACEMOSA, L. *Spikenard.*

Herbaceous; *stem* widely branched, leafy; *leaves* decompound; *leaflets* heart-ovate, doubly serrate pointed, slightly downy; *umbels* small, very numerous.

Rich rocky woods. June, July. *Roots* large, spicy, aromatic. *Stem* 2 to 5 feet high, dark green or reddish. The leaf-stalks are 3-parted, each division of which bears 3 or 5 large leaflets. *Flowers* greenish-white, in panicles 4 to 8 inches long.

3. A. HISPIDA, Michx. *Bristly Sarsaparilla.*

Stem shrubby at base, hispid; *leaves* twice pinnate; *leaflets* oblong ovate, acute, cut-serrate; *umbels* on long peduncles, axillary and terminal.

Rocky places. June—Aug. *Stem* 1 to 2 feet high, the lower part woody and thickly beset with sharp stiff bristles, the upper part branching, herbaceous.

Leaflets numerous, long. *Umbels* numerous, simple, globose. *Flowers* greenish-white. *Fruit* blackish, nauseous to the taste.

4. A. SPINOSA, L. *Angelica Tree.*

Arborescent; *stem* and petioles prickly; *leaves* large, 2 to 3-pinnate; *leaflets* ovate, pointed, serrate, sessile, glaucous beneath; *umbels* in a branched panicle, numerous.

Damp woods, Southern parts of the State. Cultivated. July, Aug. A small tree 8 to 12 feet high, (sometimes 20 to 40,) the leaves crowded near the summit. *Flowers* white, in very large terminal panicles. The bark is said to be emetic and cathartic.

2. PANAX. Linn. GINSENG.

Gr. *pan*, and *akos*, a medicine, i. e. a *panacea*, or a universal remedy.

FLOWERS polygamous. CALYX-TEETH obsolete. PETALS and STAMENS 5. STYLES 2 to 3. FRUIT a 2 to 3-lobed, 2 to 3-celled, and 2 to 3-seeded drupe, often fleshy.—*Perennial herbs or shrubs, with palmately compound leaves,* (in our species 3 stem leaves in a whorl,) *and whitish flowers in a single simple umbel on long peduncles.*

1. P. TRIFOLIUM, L. *Dwarf Ginseng. Ground-nut.*

Root globular; *leaves* 3-verticillate, 3 to 5-foliate; *leaflets* lanceolate-oblong, serrate, sub-sessile; *styles* 3; *berries* 3-seeded.

Low moist woods; common. May. A neat little plant 4 to 8 inches high with a tuber deep in the ground. *Stem* smooth, slender, simple. *Leaves* 3, in a whorl at the summit, compound, with a central peduncle terminating in a little umbel of pure white flowers. Barren and fertile flowers on different plants, the latter without stamens succeeded by green berries.

2. P. QUINQUEFOLIUM, L. *Ginseng.*

Root fusiform; *leaves* 3, verticillate, 5-foliate; *leaflets* oblong-ovate, pointed, serrate, long-petioled, the lateral ones smaller; *peduncles* shorter than the petioles; *styles* 2; *fruit* flattened; *seeds* 2.

Rich woods and mountain sides; not common. June, July. *Root* spindle shaped, 3 to 6 inches long, often forked, aromatic. *Stem* round, smooth, about 1 foot high, with a terminal whorl of 3 compound leaves, and a central peduncle bearing a single umbel of yellowish flowers. *Berries* light-scarlet. The root is highly esteemed by the Chinese and Tartars for its supposed medical properties.

3. HEDERA. Linn. IVY.

Celtic *hedra*, a cord; from the vine-like habit.

CALYX 5-toothed. PETALS 5, dilated at the base. BERRY 5-seeded, surrounded by the permanent calyx.—*European shrubby, climbing or erect plants, with simple evergreen leaves, and greenish flowers.*

H. HELIX, L. *English Ivy.*

Stem and *branches* long and flexible, attached to the earth trees or walls by its numerous radicating fibres; *leaves* dark green, smooth, with white veins, petiolate; lower ones 5-lobed, upper ovate, flowers in numerous umbels, forming a corymb; *berry* black, with a mealy pulp. Native of Britain. Cultivated.

ORDER 53. **CORNACEÆ.**

Low trees, shrubs or rarely herbaceous plants, with simple mostly opposite and entire leaves. CALYX SEPALS adherent to the ovary, with the limb minute, 4 or 5-toothed or lobed. PETALS 4 or 5 distinct, alternate with the teeth of the calyx. STAMENS 4; STYLE single; STIGMA capitate; OVARY 1 to 2-celled, with a single anatropous ovule suspended from the apex of each cell, and fruit a globose 2-celled and 2-seeded drupe.

1. CORNUS. Tourn.

Lat. *cornu*, a horn; on account of the hardness of the wood.

CALYX minutely 4-toothed. PETALS 4, oblong, spreading, sessile. STAMENS 4. STYLE 1. DRUPES berry-like, separate.—*Trees, shrubs or perennial herbs, with mostly opposite entire leaves, and white or whitish flowers in cymes, often involucrate. Bark bitter and tonic.*

* *Flowers capitate, surrounded by a petal-like 4-leaved white involucre; fruit bright red.*

1. C. CANADENSIS, L. *Dwarf Dogwood.*

Herbaceous; *stem* low and simple; *lower leaves* small, upper ones whorled, veiny, on short petioles, ovate or oval, pointed; leaves of the involucre ovate.

Damp cold woods. May—July. A handsome little plant 5 to 7 inches high, arising from a slender creeping and subterranean rather woody rhizoma, with 1 to 2 pairs of opposite leaves and a whorl of 4 to 6 at the summit, 2 of which are large, placed a little lower and opposite. *Flowers* greenish, surrounded with a large showy involucre of 4 white leaves, sometimes mistaken for a single flower.

2. C. FLORIDA, L. *Flowering Dogwood.*

Arborescent; *leaves* ovate, pointed, downy beneath when young; *leaves* of the involucre inversely heart-shaped; *flowers* and *fruit* in a close head.

Rocky woods; common. May, June. A tree 15 to 20 feet high, very showy in flower. *Flowers* inconspicuous, greenish-yellow. *Involucre* very large and showy, obovate, veiny, white, ending in a callous point, which is turned up or down so abruptly as to give an emarginate appearance to the leaf. *Berries* red, very showy

** *Flowers in cymes: involucre none; shrubs.*

3. C. CIRCINATA, L'Her. *Round-leaved Dogwood.*

Branches warty-dotted; *leaves* round-oval, abruptly pointed, white, downy beneath; *cymes* crowded, depressed; *drupe* globose.

Banks of streams. June, July. *Shrub* 6 to 10 feet high. *Stem* greyish, upright, with opposite, round, green, spotted or warty branches. *Leaves* large, 4 to 5 inches in diameter, opposite, somewhat acuminate. *Flowers* white. *Berries* light-blue, hollowed at base, crowned with the remains of the style.

4. C. SERICEA, L. *Red Osier. Silky Dogwood.*

Branches spreading; *leaves* ovate, acuminate, silk-downy (often rusty) beneath; *cymes* flat, close; *calyx-teeth* lanceolate; *drupe* globose.

Wet places, banks of streams; common. June. *Shrub* 4 to 10 feet high, with purplish bark. and opposite branches and red shoots. *Leaves* 2 to 4 inches long, ½ as wide. *Flowers* yellowish-white. *Fruit* pale-blue.

5. C. PANICULATA, L'Her. *Panicled Dogwood.*

Branches erect, smooth; *leaves* ovate-lanceolate or oval. acuminate, acute at base, whitish beneath; *cymes* convex, loose, often panicled; *fruit* depressed-globose.

Thickets and hillsides. June. *Shrub* 4 to 8 feet high, very much branched, with a yellowish bark. *Leaves* small, 1 to 2 inches long $\frac{1}{2}$ to $\frac{2}{3}$ as wide. *Flowers* profuse, pure white, in small conical cymes. *Drupe* small, white or bluish.

6. C. STOLONIFERA, Michx. *Red-Osier Dogwood.*

Stem often with running shoots; *branches* spreading, smooth; *leaves* ovate rounded at base; abruptly acuminate; *cymes* small, flat, rather crowded; *drupe* globose.

Bogs and wet banks of streams. May, June. A small tree 8 to 10 feet high, with smooth, slender, spreading branches, which are mostly red in winter. It multiplies by prostrate running suckers which send up red shoots forming large clumps 3 to [illegible] feet high. *Leaves* distinctly veined, minutely pubescent, and whitish beneath, petiolate. *Flowers* white, in small cymes. *Drupe* small or lead colored.

7. C. ALTERNIFOLIA, L. *Alternate-leaved Dogwood.*

Leaves alternate, oval, long-pointed, acute at the base, whitish and minutely pubescent underneath; *drupes* globose.

Hillsides and moist shady woods. June. A small tree or shrub 8 to 20 feet high, with spreading one-sided branches forming a depressed summit. *Bark* greenish. marked with warty streaks. *Flowers* in broad open cymes, pale buff-color. *Fruit* dark-blue.

DIVISION II.

MONOPETALOUS EXOGENOUS PLANTS.

Floral envelopes consisting of both calyx and corolla, the latter composed of petals more or less united (monopetalous.)

ORDER 54. **CAPRIFOLIACEÆ.**—*Honey-suckle Plants.*

Shrubs or rarely herbs, often twining, with opposite leaves, no stipules, the CALYX TUBE coherent with the 2 to 5-celled ovary. COROLLA tubular or rotate, regular or irregular. STAMENS as many, or one less than as many, as the lobes of the corolla, and inserted on its tube. STYLES 1; STIGMA 1 to 4. FRUIT a berry, drupe, or capsule.

TRIBE 1. LONICEREÆ.

Corolla tubular, often irregularly cleft; style slender; stigma capitate.

1. LONICERA. Linn.

In honor of *Lonicer*, a German botanist of the 16th century.

CALYX 5-toothed; *teeth* very short. COROLLA tubular or funnel-form, often swelled at the base, irregularly or nearly regularly 5-lobed. STAMENS 5. OVARY 2 to 3-celled. STIGMA capitate. BERRY several seeded.—*Climbing or erect shrubs, with opposite and often connate entire leaves, and often showy, fragrant flowers.*

* CAPRIFOLIUM. *Stem climbing; flowers in sessile whorled clusters from the axils of the leaves.*

1. L. SEMPERVIRENS, Ait. *Trumpet Honey-suckle.*

Leaves oblong evergreen, pale beneath, the lower petioled, the uppermost pairs united around the stem; *flowers* in nearly naked spikes or distant whorls.

Borders of swamps; common in cultivation. May—Oct. A beautiful climber blooming all summer. *Stem* 6 to 20 feet long, woody, twining with the sun. *Leaves* deciduous at the north. *Corolla* trumpet-shaped, nearly 2 inches long, dilated at the mouth, with 5 short, nearly regular segments, of a rich scarlet without and yellow within. A variety has pale yellow blossoms. *Berries* scarlet.

2. L. GRATA, Ait. *American Woodbine.*

Leaves obovate, smooth, glaucous beneath, the upper pairs united; *flowers* in sessile, terminal and axillary whorls; *corolla* ringent, tube long, slender, not swelled.

Rocky woodlands. May, June. A beautiful climber with very obtuse leaves, ending in an abrupt point, opposite or in whorls of 3. *Flowers* large and very fragrant, 5 or 6 in each whorl. *Corolla* white, within a purple, fading yellowish. *Berries* red. Cultivated.

3. L. PARVIFLORA, Lam. *Small-flowered Honey-suckle.*

Leaves smooth, elliptical or oblong, shining above, glaucous beneath, the upper pairs united, all closely sessile; *flowers* in heads of several approximate whorls; *corolla* ringent; *tube* short, swelled at the base; *filaments* bearded.

Rocky banks; common. May, June. A low branching species. *Leaves* thickish, wavy and revolute on the margin, very glaucous beneath. *Flowers* small, yellow, tinged with dull red. *Stamens* and *styles* exserted. *Berries* orange-colored.

4. L. PERICLYMENUM, Tourn. *Woodbine Honey-suckle.*

Leaves elliptical, on short petioles, deciduous. *Flowers* in ovate imbricated terminal heads; *corolla* ringent, yellow and red, fragrant. *Berries* red. May—July. A woody climber, native of Europe. Cultivated.

5. L. CAPRIFOLIUM, L. *Italian Honey-suckle.*

Leaves deciduous, the upper pair united. *Flowers* in a terminal verticel, yellow, red and white. Much admired for its beauty and fragrance. Native of Europe. June—Aug. Cultivated.

* * XYLOSTEUM, Juss. *Stem erect; leaves distinct; peduncles axillary, single, 2-bracted and 2-flowered at the summit.*

6. L. CILIATA, Muhl. *Fly Honey-suckle.*

Leaves oblong-ovate, often cordate, distinctly petioled, thin, downy beneath; *peduncles* shorter than the leaves; *bracts* minute; *corolla* funnel-form, swelled at the base.

Rocky woods, Northern parts of the State. May, June. A branching erect shrub 3 to 4 feet high. *Flowers* pale straw-yellow, in pairs, at the top of the peduncle, with an obtuse spur turned outwards at the base. *Berries* ovoid, red, in pairs.

7. L. TARTARICA, L. *Tartartan Honey-suckle.*

Stems erect, much branched; *leaves* ovate, cordate, obtuse, shining and dark-green above, pale beneath, entire, on short petioles; *peduncles* axillary, solitary, 2-flowered; *segments* of the corolla oblong, obtuse, equal. An elegant shrub much admired in cultivation. Native of Russia and Tartary. *Stems* 4 to 8 feet high, forming large clumps. *Leaves* 1 to 2 by ¾ to 1½ inches, coriacioue. *Flowers* small, pale-purple, varying to pure white, very fragrant. May—June.

2. DIERVILLA, Tourn. BUSH HONEY-SUCKLE.

In honor of *M. Dierville*, who sent this species from Canada to Tournefort.

CALYX-TUBE tapering at the summit; the *lobes* slender, awl-shaped, persistent. COROLLA funnel-form, 5-lobed, nearly regular. STAMENS 5. CAPSULE oblong, acute, 2-celled, 2-valved, septicidal, many-seeded.—*Low upright shrubs, with opposite, ovate, serrate pointed leaves, and yellowish flowers in cymosely-several-flowered peduncles.*

D. TRIFIDA, Mœnch. *Bush Honey-suckle.*

Leaves oblong-ovate, acuminate, petioled; *peduncles* mostly 3-flowered; *capsule* long-beaked.

Rocky woods and banks of streams. May—July. *Stem* 1 to 3 feet high, branching. *Leaves* 2 to 4 by 1 to 1½ inches, finely serrate, long-pointed. *Flowers* greenish-yellow. *Style* much exserted. *Stigma* capitate.

3. TRIOSTEUM. Linn.

Gr. *treis*, three, and *ost on*, a bone; alluding to the three bony seeds.

CALYX-LOBES 5, linear-lanceolate, leaf-like, persistent. COROLLA tubular, swelled at the base, somewhat equally 5 lobed, scarcely longer than the calyx. STAMENS 5, included. STIGMA capitate, lobed. FRUIT a drupe, mostly 3-celled, crowned with the calyx, containing 3 angled and ribbed, bony nuts.—*Coarse hairy perennial herbs, with the stem leafy to the top, and the ample entire pointed leaves tapering to the base, but connate around the stem.*

1. T. PERFOLIATUM, L. *Feverwort.*

Softly hairy; *leaves* oval or spatulate-ovate, acuminate, entire, abruptly narrowed at the base, crenate, downy beneath; *flowers* sessile, 1 to 3 in the axils of the leaves.

Rich woodlands. June. *Stem* 2 to 4 feet high. *Leaves* 6 by 3 inches. *Fruit* a rather dry drupe, orange-colored. The root is large and fleshy, and in some repute in medicine.

2. T. ANGUSTIFOLIUM, L. *Narrow-leaved Feverwort.*

Bristly hairy; *leaves* lanceolate, tapering to the base; *flowers* mostly solitary in the axils, sessile or pedunculate.

Shady places, along fences. May, June. *Stem* 1 to 2 feet high. *Flowers* greenish-cream-color, mostly singly clustered in the axils of the leaves.

4. SYMPHORICARPUS. Dill.

Gr. *symphorco*, to bear together, and *carpus*, fruit; from the clustered berries.

CALYX-TUBE 4 to 5-toothed; persistent; *teeth* small. COROLLA bell-shaped, nearly regularly 4 to 5-lobed. STAMENS 4 to 5, inserted into the throat of the corolla. OVARY 4-celled, only 2 of the cells with a fertile ovule; the *berry* therefore 4-celled and 2-seeded. SEEDS long.—*Low and branching upright shrubs, with oval shortly petioled leaves, and small white flowers tinged with rose-color, in close short spikes or clusters.*

1. S. VULGARIS, Michx. *Indian Currant. Coral-berry.*

Leaves round-oval; *flowers* in small spikes or clusters in the axils of nearly all the leaves; *corolla* sparingly bearded.

Banks of streams. July. *Stem* 2 to 3 feet high, with numerous purplish branches. *Corolla* greenish-red, companulate, lobes nearly smooth; *stamens* and *bearded style* included. *Berries* small, purplish.

2. S. RACEMOSUS, Michx. *Snow-berry.*

Leaves oval or oblong, the margin often wavy, nearly or quite smooth, paler beneath, on short petioles; *flowers* in a terminal loose and somewhat leafy interrupted spike.

Cultivated; native from Lake Champlain to Wisconsin. June, Sept. *Stem* 2 to 4 feet high. *Corolla* rose-color, the throat filled with hairs. *Berries* large, round or ovoid, of a snowy white, remaining till winter, very ornamental.

5. LINNÆA. Gron.

In honor of *Linnæus*, the most profound of naturalists, ancient or modern, with whom this charming little plant was an especial favorite.

CALYX-TEETH 5, awl-shaped, deciduous. COROLLA narrow, bell-shaped, nearly equally 5-lobed. STAMENS 4, 2 of them shorter, inserted near the base of the corolla. OVARY 3-celled, 1-ovuled, (2 cells abortive,) forming a 1-seeded dry berry.—*A slender creeping and trailing evergreen, with round-oval leaves and delicate nodding flowers, widely disseminated through the northern temperate zone.*

L. BOREALIS, Gron. *Twin-flower.*

Stem slender, creeping and trailing; *leaves* round-oval, sparingly crenate, contracted at the base into short petioles; *peduncles* filiform, forking into 2 pedicels at the top, each bearing one flower.

Moist mossy woods; common northward. June. *Stems* long, filiform, brownish, rooting and branching their whole length, and covering the ground in large patches. *Leaves* small, opposite, with obtuse lobes or teeth and scattered hairs. *Flowers* nodding, delicate and fragrant, rose-colored.

TRIBE 2. SAMBUCEÆ. THE ELDER TRIBE.

Corolla regular, rotate; stigmas 3 *to* 5, *nearly sessile.*

6. SAMBUCUS. Tourn. ELDER.

Gr. *sambuca*, an ancient musical instrument, supposed to have been made of Elder-wood.

CALYX small, 5-parted. COROLLA urn-shaped, with a broadly spreading 5-cleft limb. STAMENS 5. STIGMAS 3, obtuse, small, sessile. FRUIT a berry-like juicy drupe, containing 3 seeds.—*Shrubby plants, with pinnate leaves, serrate pointed leaflets, and numerous small white flowers in compound cymes.*

1. S. Canadensis, L. *Common Elder.*

Stems scarcely woody; *leaflets* 7 to 11, oblong, smooth, the lower often 3-parted; *cymes* flat, 5-parted.

Thickets and waste grounds; common. May, June. *Stem* 5 to 10 feet high, filled with a light porous pith, especially when young. *Flowers* numerous, in very large (1 foot broad) level-topped cymes, white, rather fragrant. *Berries* dark purple or black.

2. S. pubens, Michx. *Red-berried Elder.*

Stems woody; *leaflets* 5 to 7, ovate-lanceolate, downy beneath; *cymes* panicled, convex-pyramidal.

Rocky woods. June, July. *Stem* 6 to 8, sometimes 15 feet high, warty, often round-topped and tree-like. *Leaves* simple and unequally pinnate. *Flowers* in a close ovoid thyrse or panicle. *Corolla* white. *Berries* small, scarlet.

7. VIBURNUM. Linn.

Calyx 5-toothed, persistent. Corolla rotate, spreading, deeply 5-toothed. Stamens 5, equal. Stigmas 3, sessile. Fruit a 1-celled, 1-seeded drupe with thin pulp and a hard flattened stone.—*Shrubs or small trees, with petioled leaves, and white flowers in flat compound cymes.*

* 1. Lentago, DC. *Flowers all alike and perfect; fruit blue or black when ripe, glaucous.*

Leaves serrate or toothed, entire.

1. V. prunifolium, L. *Black Haw.*

Branches spreading, smooth; *leaves* broadly oval, obtuse at both ends, finely and sharply serrate, shining above, smooth; *petioles* naked; *cymes* sessile; *fruit* ovoid-oblong.

Woods: common. May. A shrub or small tree 10 to 20 feet high, with spreading, sometimes stinted branches. *Leaves* about 2 inches long, 1½ wide, on short, slightly margined petioles. *Cymes* large, terminal, sessile. *Flowers* white. *Fruit* dark-blue or blackish, sweet and eatable.

2. V. nudum, L. *Withe Rod. Swamp Haw.*

Leaves thickish, oval, oblong or lanceolate, revolute at the edge, sub-crenate; *cyme* short peduncled; *fruit* round-ovoid.

Cold swamps; common. May, June. A handsome shrub 6 to 10 feet high. *Leaves* 3 to 4 inches long, punctate-dotted beneath like the short petioles and cymes, with small brownish scales, smooth above, the margin more or less rolled. *Flowers* numerous, white. *Berries* dark blue, covered with a glaucous bloom, eatable.

3. V. Lentago, L. *Sweet Viburnum.*

Leaves ovate, acuminate, acutely and sharply serrate; *petioles* with wavy margins; *cymes* terminal, sessile; *fruit* oval.

Rocky woods. May, June. A small handsome tree 10 to 20 feet high. *Leaves* smooth, long-acuminate, 3 inches long, ½ as wide, on long wavy margined petioles. *Petioles* midribs and branches of the cyme sprinkled with rusty glands when young. *Flowers* white, in broad spreading cymes. *Berries* ½ inch long, blue-black when ripe.

4. V. dentatum, L. *Arrow-wood.*

Smooth; *leaves* broadly-ovate, coarsely and sharply-toothed, sub-plicate; *petioles* slender; *cymes* peduncled; *fruit* ovoid-globose.

Damp grounds, rather common. June. *Shrub* 8 to 12 feet high, with long, straight, slender branches when young, and ash-colored bark. *Leaves* on slender petioles, roundish, 2 to 3 inches in diameter, strongly straight-veined, and often with hairy tufts in the axils of the veins beneath. *Flowers* white, in large expanding cymes. *Fruit* small, dark-blue.

5. V. PUBESCENS, Pursh. *Downy Arrow-wood.*

Leaves ovate or oblong-ovate, acute or pointed, rarely toothed, sub-plicate; *cymes* peduncled; *fruit* ovoid.

Dry rocky places; rare. June. *Shrub* about 2 to 6 feet high, somewhat straggling. *Leaves* 2 inches long, strongly straight-veined, each with a pair of short, hairy, stipular appendages at the base of the short petiole. The lower surface and petioles velvety-downy. *Cymes* small, few-flowered. *Flowers* white.

Leaves lobed or incised.

6. V. ACERIFOLIUM, L. *Maple-leaved Arrow-wood.*

Leaves 3-lobed, cordate at the base, coarsely and unequally toothed; *cymes* on long peduncles, many-flowered; *fruit* oval.

Rocky hillsides. June. A shrub 4 to 8 feet high, with yellowish-green bark. *Leaves* broad, heart-shaped, or rounded at the base; lobes acuminate, with sharp serratures; veins and stalks hairy; under surface and young stalks downy. *Flowers* white, with a slight tinge of red; *filaments* long. *Fruit* nearly black.

* * OPULUS, Tourn. *Marginal flowers of the cymes destitute of stamens and with large showy corollas.*

7. V. LANTANOIDES, Michx. *Hobble-bush.*

Leaves round ovate, abruptly pointed, closely serrate; *cymes* closely sessile, broad and flat; *fruit* ovoid.

Rocky woods, near streams. May. A straggling shrub 4 to 8 feet high, the decumbent branches often taking root. *Leaves* heart-shaped at the base, many-veined, the veins, veinlets, stalks and branchlets very scurfy with rusty colored tufts of minute down. *Flowers* white, the sterile ones very large. *Fruit* red, when ripe, black.

8. V. OPULUS, L. *Cranberry-tree.*

Leaves 3-lobed, wedge-shaped or truncate at the base, 3-nerved; *lobes* spreading, pointed, toothed on the sides, entire in the sinuses; *petioles* glandular; *cymes* peduncled, radient; *fruit* ovoid.

Woods; rare. June. A handsome shrub 8 to 12 feet high, with spreading branches. *Leaves* with large remote teeth, the *stalks* with 2 or more glands at the base, channelled above. *Flowers* white, the central fertile, those of the border large, barren. *Fruit* red, very acid, resembling the common cranberry in flavor, and is sometimes substituted for it.

Var. *b.* ROSEUM, L. *Guelder Rose. Snow-ball. Leaves* rather acute at base, longer than broad, lobes acuminate, with long pointed teeth: *petioles* glandular; *flowers* all sterile in globose cymes. This is a well known European variety, cultivated for its large, dense spherical clusters of snow-white flowers, which are all barren.

ORDER. 55. **RUBIACEÆ.**—*Madder Family.*

Shrubs or herbs, with opposite entire leaves connected by interposed stipules, or rarely whorled without apparent stipules. CALYX usually coherent with the 2 (rarely 3 to 4)-celled ovary, or in one group, free. STAMENS as many as the lobes of the regular corolla, and inserted on its tube. OVARY 2-celled. STYLE mostly simple; STIGMAS 2. FRUIT various.

SUB-ORDER I. STELLATÆ. THE TRUE MADDER FAMILY.

Leaves whorled, with no apparent stipules; ovary 2-celled, entirely coherent with the calyx-tube. Herbs.

1. GALIUM. Linn. CLEAVERS.

Gr. *gala*, milk, which some species are used to curdle.

CALYX minute, 4-toothed. COROLLA 4-parted, rotate. STAMENS 4, short. STYLES 2. FRUIT twin, globular, separating when ripe into the 1 seed-like indehiscent, 1-seeded carpels.—*Slender herbs, with 4-angled stems, verticellate leaves, and small cymose flowers.*

* *Annual: leaves about 8, in a whorl; peduncles few-flowered.*

1. G. APARINE, L. *Cleavers. Goose-grass.*

Stem weak, procumbent, retrorsely prickly, hairy at the joints; *leaves* in whorls of 6s, 7s or 8s, linear-oblanceolate, mucronate; *peduncles* axillary, 1 to 2-flowered; *fruit* bristly, with hooked prickles.

Moist thickets. June. *Stems* 2 to 6 feet long, leaning on other plants and closely adhering to objects in their way by their hooked prickles. *Leaves* 1 to 2 inches long, ¼ wide, rough on the margins and midribs. *Flowers* numerous, small, white. *Fruit* rather large, armed with hooked prickles. The root is sometimes used to dye red. Medicinal.

* * *Perennial: leaves 4 to 6, and sometimes 8 in a whorl; peduncles axillary and terminal, few-flowered; fruit smooth.*

2. G. ASPRELLUM, Michx. *Rough Bedstraw.*

Stem diffuse, weak, much branched, rough backwards; *leaves* in 6s, 5s or 4s, lanceolate, acuminate or cuspidate; *peduncles* many, short, 2 to 3 times forked.

Low thickets; common. July. *Stem* weak, 2 to 5 feet long, reclining on other plants, and closely adhering to them by their minute retrorse prickles. *Leaves* ½ to ¾ inches long, ¼ as wide. *Flowers* numerous, small, white. *Fruit* minute, smooth.

3. G. TRIFIDUM, L. *Small Bedstraw. Dyer's Cleavers.*

Stem decumbent, very branching, roughish with retrorse prickles; *leaves* in whorls of 4 to 6, linear or oblanceolate, obtuse, the margins and midribs rough; *peduncles* 1 to 3-flowered: *pedicels* slender; *corolla-lobes* and *stamens* often 3.

Var. 1. TINCTORIUM; *stem* stouter with nearly smooth angles, and the parts of the flowers usually in fours.

Var. 2. LATIFOLIUM; *stem* smooth, widely branched; *leaves* elliptical or oblong, quite rough on the midribs and margins.

Swamps and low grounds; common and very variable. June—Aug. *Leaves* ¼ to ½ inch long, ¼ as wide, often wedge-shaped at the base. *Peduncles* mostly in 3, axillary. *Flowers* small, white.

4. G. TRIFLORUM, Michx. *Sweet-scented Bedstraw.*

Stem weak, often procumbent, bristly on the angles, turned backwards; *leaves* in 5s and 6s, elliptical-lanceolate, acuminate-cuspidate; *peduncles* 3-flowered; *flowers* all pedicelled; *fruit* hisped, with hooked hairs.

Rich woodlands; common. July. *Stem* 1 to 4 feet long, slightly branched. *Leaves* 1 to 2 inches long, ¼ as broad, 1-veined, scarcely ciliate on the margin. *Flowers* small, greenish-white; *lobes* of the *corolla* pointed. *Fruit* whitish.

* * * *Peduncle several-flowered; petals pointed; fruit densely hooked, prickly.*

5. G. PILOSUM, Ait. *Hairy Bedstraw.*

Stem ascending, somewhat simple, hairy; *leaves* in 4s, oval, dotted, hairy, indistinctly 3-veined; *peduncles* several times forked, each division 2 to 3-flowered, the flowers all pedicelled.

Dry woods; rare. June—Aug. *Stem* 1 to 2 feet high acutely 4-angled, with a few short spreading branches. *Leaves* ¾ to 1 inch long, ½ as wide, very hairy. *Flowers* purplish.

6. G. CIRCÆZANS, Michx. *Wild Liquorice.*

Stem smooth or downy, erect or ascending; *leaves* in 4s, oval, mostly obtuse, 3-nerved, ciliate; *peduncles* lateral and terminal, diverging, few-flowered.

Var. 1. LANCEOLATUM, Torr. *Leaves* lanceolate or ovate-lanceolate, tapering to the point, slightly ciliate.

Var. 2. MONTANUM, Torr. & Gr. Dwarf; *leaves* obovate, nearly smooth.

Rich woods. July, Aug. *Stem* about 1 foot high, simple, or with a few short branches near the top. *Leaves* 1 to 2 inches long, ⅓ as wide. *Peduncles* usually once forked, the branches elongated and widely diverging in fruit, and bearing several ovate flowers on very short lateral pedicels. *Flowers* purple. *Fruit* clothed with dense white bristles resembling Circæa. The leaves and root have a sweet taste like the liquorice.

**** *Peduncles many-flowered, in close terminal panicles.*

7. G. BOREALE, L. *Northern Galium.*

Stem upright, smooth; *leaves* in 4s, linear-lanceolate, 3-nerved, smooth; *flowers* in a terminal, pyramidal panicle; *fruit* minutely bristly.

Rocky shady places, and fence-rows. June—Aug. *Stems* 12 to 18 inches high, branched above. *Leaves* 1 to 2 inches long, ¼ as wide, tapering to an obtuse point. *Flowers* numerous, small, white, in an elongated panicle, making rather a handsome appearance. *Fruit* small.

SUB-ORDER II. CINCHONEÆ. THE CINCHONA FAMILY.

Leaves opposite with stipules between them; ovary coherent with the calyx-tube, or the apex rarely free.

2. CEPHALANTHUS. Linn. BUTTON-BUSH.

Gr. *kephale*, a head, and *anthos*, a flower.

CALYX small, angular, inversely pyramidal, 4-cleft. COROLLA tubular, slender, 4-toothed. STYLE filiform, much exserted; *stigma* capitate. FRUIT dry and hard, 2 to 4-celled, 2-seeded, mostly 2-parted.—*Shrubs with opposite leaves, short stipules, and white flowers densely aggregated in globose heads.*

1. C. OCCIDENTALIS, L. *Button-bush. Pond Dogwood.*

Mostly smooth; *leaves* opposite, or in 3s, petioled, ovate-oblong, pointed, with short intervening stipules; *peduncles* long.

Borders of ponds and streams, forming thickets; common. July, Aug. *Stem* 4 to 6 feet high, branched. *Leaves* spreading, entire, 3 to 5 inches long, 2 to 3 wide. *Heads* of *flowers* about 1 inch in diameter. *Corolla* white, tubular, with long projecting styles. *Flowers* inserted on all sides of the round receptacle.

3. MITCHELLA. Linn. PARTRIDGE-BERRY.

In honor of *Dr. John Mitchell*, a botanist of Virginia.

FLOWERS in pairs, with their ovaries united. CALYX

4-toothed. COROLLA funnel-form, 4-lobed, the lobes spreading, densely bearded inside. STAMENS 4. STYLES slender; *stigmas* 4. FRUIT a berry-like double drupe, crowned with the calyx-teeth of the two flowers, each containing 4 small seed-like bony nutlets.—*Smooth and trailing evergreen herbs, with rose-color flowers, and bright scarlet edible berries remaining over winter.*

1. M. REPENS, L. *Partridge-berry.*

Stem creeping; *leaves* roundish-ovate, often slightly cordate, petiolate; *peduncles* 2-flowered.

Woods; common. June, July. A handsome trailer. *Leaves* dark-green and shining, usually variegated with whitish lines. *Flowers* fragrant. *Berries* remarkable for their double structure, well flavored, but full of stony seeds.

4. HEDYOTIS. Linn.

Gr. *hedos*, sweet, and *ous, otos*, an ear, of no obvious application.

CALYX 4 lobed, persistent. COROLLA funnel-form, salver-form, or wheel-shaped, the limb 4-parted. STAMENS 4. STIGMAS 2. CAPSULE 2-celled, many-seeded.—*Herbs, rarely shrubs, with opposite leaves and stipules connate with the petiole.*

* AMPHIOTIS, DC. *Corolla funnel-shaped, longer than the calyx-teeth; flowers in terminal racemes; perennials.*

1. H. PURPUREA, Torr. & Gray. *Purple Hedyotis.*

Pubescent; *leaves* ovate or lanceolate, 3 to 5-veined, closely sessile; *calyx-lobes* longer than the capsule, lance-linear; *cymes* 3 to 7-flowered, often clustered.

Woods and river banks. May—July. *Stems* ascending, 8 to 15 inches high, clustered, branching, 4-angled. *Leaves* 1 to 2 inches long, ⅓ as wide. *Flowers* 3 to 7 in a cluster, pink-purple, or nearly white.

2. H. LONGIFOLIA, Hook. *Long-leaved Hedyotis.*

Smooth; *radical leaves* oval-elliptic, narrowed to each end; *stem leaves* linear or lance-linear, 1-veined; *flowers* in small paniculate cymes; *calyx-lobes* scarcely as long as the capsule.

Dry hills and shady banks. June. *Stems* somewhat tufted, 5 to 10 inches high, 4-angled. *Leaves* 1 to 1½ inches long, ¼ as wide, sessile on the stem. *Flowers* 2 or 3 together, on very short pedicels, pale purple, with deeper colored lines in the throat.

* * HOUSTONIA, Linn. *Corolla nearly salver-form, with a long tube, limb smooth; peduncles 1-flowered.*

3. H. CÆRULIA, Hook. *Innocence. Venus' Pride.*

Smooth; *stems* erect, numerous, dichotomous; *radical leaves* ovate-spatulate, petiolate; *pedicels* filiform, 1 to 2-flowered.

Moist banks; common. May—Aug. An elegant little plant 3 to 5 inches high, producing in spring a profusion of handsome bright blue flowers, with a yellow eye. The stem leaves are small, opposite, lance-ovate.

SUB-ORDER III. LOGANEÆ.

Leaves opposite, with stipules between them, united with the petioles; ovary free from the calyx.

5. SPIGELIA. Linn. PINK-ROOT.

In honor of *Prof. Spigelius,* who wrote on botany at the beginning of the 17th century.

CALYX 5-parted, persistent; the *lobes* slender. COROLLA tubular-funnel-form, 5-lobed at the summit. STAMENS 5. STYLE slender, hairy above. CAPSULE short, twin, 2-celled, separating at maturity into 2 carpels, few-seeded.—*Chiefly herbs, with opposite leaves, united by means of stipules, and showy flowers in spikes or 1-sided cymes.*

S. MARILANDICA, L. *Pink-root. Worm-grass.*

Erect, simple, nearly smooth; *stem* square; *leaves* sessile, oval-lanceolate, acute or pointed, roughish, hairy on the margin and ribs; *spike* 3-flowered.

Rich woods; rare. June. A beautiful herb with dark green foliage and scarlet flowers. *Stem* 1 foot high. *Leaves* 3 to 4 inches long, ½ as wide, entire. *Flowers* 1½ to 2 inches long, somewhat clavate, scarlet without, yellow within. *Style* exserted.

ORDER 56. VALERIANACEÆ.

Herbs with opposite leaves and no stipules; the calyx-tube coherent with the ovary. COROLLA tubular or funnel-form 4 to 5-lobed, sometimes spurred at the base. STAMENS 1 to 5. STYLE slender; STIGMAS 1 to 3. FRUIT indehiscent with 1 fertile cell and 2 empty ones. SEEDS suspended, anatropous, with a large embryo and no albumen.

FEDIA. Gært. CORN-SALAD.

CALYX with the limb 3 to 6-toothed and persistent or obsolete. COROLLA tubular, 5-lobed, regular. STAMENS 3. FRUIT 3-celled, two of the cells empty and sometimes confluent into one, the other 1-seeded.—*Annuals and biennials, with forking stems, opposite sessile leaves, and white or whitish clustered-cymose small flowers.*

F. OLITORIA, Vahl. *Lamb Lettuce.*

Leaves spatulate, obtuse; *radical leaves* petiolate; *fruit* compound, oblique at length, broader than long, the cross section elliptical, with a corky or spongy mass at the back of the fertile cell.

Fields; naturalized. June. *Stem* smooth, 4 to 10 inches high, forked. *Leaves* mostly entire. *Flowers* in dense corymbs, white.

ORDER 57. DIPSACEÆ.—*Teasel Family.*

Herbs with opposite or whorled leaves, no stipules, flowers in dense heads, upon a common receptacle, surrounded with a many-leaved involucre. CALYX adherent, often pappus-like. COROLLA tubular, somewhat irregular, the limb 4—5 parted. STAMENS 4, alternate with the lobes of the corolla. STYLE 1, simple. FRUIT dry, indehiscent, with a single suspended seed.

1. DIPSACUS. Tourn. TEASEL.

Gr. *dipsao*, to *thirst*, alluding to the water held in the axils of the leaves.

FLOWERS in heads. INVOLUCRE many-leaved, longer than the chaffy, leafy-tipped, pointed bracts among the capitate flowers. CALYX superior. COROLLA tubular, 4-cleft, nearly regular. STAMENS 4, inserted on the corolla. FRUIT 1-seeded, crowned with the calyx.—*Stout and coarse biennials, hairy and prickly, with opposite, connate (sometimes distinct) leaves, and bluish or whitish flowers in large oblong heads.*

1. D. SYLVESTRIS, Mill. *Wild Teasel.*

Leaves lance-oblong, toothed, or the uppermost entire, connate; leaves of the involucre slender, longer than the head of flowers.

Naturalized by hedges and roadsides. Aug. Native of Europe. *Stem* 3 to 4 feet high, angled and prickly with the opposite and lanceolate leaves united around it. *Bracts* (chaff) tapering into a long flexible awn with a straight point. *Flowers* bluish, in a large oval or cylindrical head.

2. D. FULLONUM, L. *Fuller's Teasel.*

Leaves connate, entire or serrate; *heads of flowers* cylindrical; *bracts* hooked, *involucre* spreading. A cultivated European plant, used by the clothiers who employ the heads with the hard, hooked scales to raise the nap upon woolen cloth, *Stem* erect, furrowed, prickly, hollow, about 5 feet high. *Leaves* 2 at each node. united at their bases around in such a way as to hold a quantity of water. *Flowers* whitish, in large oval or ovoid heads. July.

2. SCABIOSA. Linn.

Lat. *scabies*, leprosy; said to be useful in cutaneous diseases.

CALYX 5-parted divisions long, bristly, sometimes partially abortive. INVOLUCRE many-leaved. INVOLUCEL nearly cylindrical with 8 little excavations.—*Biennial and perennial mostly European herbs, with opposite leaves and showy flowers in heads.*

1. S. SUCCISA, L. *Devils'-bit.*

Root premorse; *stem leaves* remotely toothed; *heads of flowers* nearly globose; *corolla* in 4 equal segments. Cultivated in gardens. *Stem* 1 foot high. *Corolla* pale violet. Sept.

2. S. ATROPURPUREA, L. *Mourning Bride.*

Leaves pinnatifid and incised; *heads of flowers* radiant; *receptacle* cylindrical; outer *crown of the seed* short, lobed and crenate. A handsome species, 2 to 4 feet high, with dense heads of dark purple, pink, and whitish flowers. Sept.

ORDER 58. **COMPOSITÆ.**

An immense family, chiefly herbs in temperate regions, without stipules with perfect, polygamous, monœcious or diœcious flowers. *Flowers* in close heads (the compound flower of the older botanists) upon a common receptacle, surrounded by an involucre. CALYX closely adherent to the ovary, the limb wanting or membranaceous and divided into bristles, hairs, &c., called *pappus*. COROLLA superior, consisting of 5 united petals either *ligulate* (strap-shaped) or *tubular*. STAMENS 5, inserted on the corolla, their *anthers* united in a tube (*syngenesious*). STYLE 2-cleft at the apex. FRUIT seed-like (*achenium*,) dry, containing a single, erect anatropous seed, with no albumen.

SUB-ORDER I. TUBULIFLORÆ.

Corolla of the perfect or disk flowers tubular, regular, the limb 5-cleft, or lobed; the ligulate or ray-flowers, when present, either pistillate only or neutral (with neither stamens nor pistils), and occupying the border.

TRIBE I. VERNONIACEÆ.

Heads discoid (without ray flowers); *the flowers all alike, perfect, tubular; branches of the style slender and thread-form, or bristle-form, acute, hairy all over, the stigmatic lines only on the lower part*, (corolla often slightly irregular).

1. VERNONIA. Schreb. IRON-WEED.

In honor of *Wm. Vernon*, an English botanist who traveled in this country.

HEADS 15, many flowered, in corymbose cymes. FLOWERS all tubular. INVOLUCRE shorter than the flowers, of many appressed closely imbricated scales. RECEPTACLE naked. ACHENIA cylindrical, ribbed. PAPPUS double, the outer chaffy; the interior capillary.—*Perennial herbs, with alternate leaves and mostly purple flowers.*

NOVEBORACENSIS, Willd. *Common Iron-weed.*

Stem erect, smoothish; *leaves* on short petioles, elliptical-lanceolate, pubescent beneath; *heads* numerous, 20 to 30-flowered; *scales of the involucre* tipped with a long bristle-form or awl-shaped spreading appendage, or awn.

Low grounds; common. Aug., Sept. *Stem* branching at top, reddish, 3 to 6 feet high. *Leaves* crowded, paler beneath; *root-leaves* sometimes lobed. *Flowers* deep purple, in terminal flat-topped compound cymes. *Scales* purple, ending in long thread-like appendages.

2. ELEPHANTOPUS. Linn. ELEPHANT'S-FOOT.

Gr. *elephas*, elephant, *and pous*, foot.

HEADS 3 to 5-flowered, clustered into compound heads. INVOLUCRE narrow and flattened, of 8 oblong dry scales. ACHENIA many-ribbed. PAPPUS of stout bristles, chaffy, dilated at the base.—*Perennials, with alternate subsessile leaves and violet-purple flowers.*

E. CAROLINIANUS, Willd. *Carolinian Elephant's-foot.*

Stem branched, leafy, somewhat hairy; *leaves* ovate-oblong, thin, obtuse, crenate serrate; *heads* terminal and sub-terminal.

Dry soils. July—Sept. *Stem* 2 to 3 feet high, divaricately branched. *Lower stem leaves* 5 to 7 inches by 3 to 5, upper ½ as large. *Heads* composed of four clusters, each 4-flowered, with the involucre 9 to 10-leaved. *Corolla* purple.

TRIBE 2. EUPATORIACEÆ.

Heads discoid or radiate; branches of the style much elongated, obtuse or club-shaped, minutely pubescent towards the summit outside; anthers without tails at the base; leaves mostly opposite.

SUB-TRIBE 1. EUPATORIEÆ. *Heads discoid. Flowers all alike, perfect and tubular seldom yellow.*

3. LIATRIS. Shreb. BUTTON SNAKE-ROOT.

HEADS several-many-flowered. SCALES OF THE INVOLUCRE imbricated. RECEPTACLE naked. FLOWERS all tubular. COROLLA 5-lobed, the *lobes* slender. PAPPUS of 15 to 40 capillary bristles, plumose or barbellate. STYLE with the branches much exserted. ACHENIA slender, about 10-ribbed, somewhat cylindric.—*Perennial herbs, with tuberous roots, chiefly with simple wand-like stems, many narrow rigid alternate entire leaves, and the heads of showy flowers arranged in an elongated spike or raceme.*

* *Heads* 16 to 60-*flowered.*

1. L. SQUARROSA, Willd. *Blazing Star.*

Stem simple, smooth or scabrous-pubescent; *leaves* linear, elongated; *heads* few, sessile or nearly so; *scales of the involucre* numerous, with elongated and leaf-like spreading tips; *inner ones* pointed, scarcely colored; *flowers* numerous; *pappus* plumose.

Dry soils. Aug. A handsome plant 1 to 3 feet high, thickly beset with long linear leaves. *Heads* 5 to 20, generally 4 to 5. *Flowers* brilliant purple.

2. L. SCARIOSA, Willd. *Gay Feather.*

Scabrous-pubescent; *stem* stout; *leaves* lanceolate, lower on long petioles, upper linear or linear-lanceolate much smaller; *heads* few or many, 30 to 60-flowered, remotely racemed; *scales* of the *somewhat spherical involucre* obovate or spatulate, with dry and scarious often colored tips or margins; *pappus* scabrous.

Dry sandy soils; rare. Sept. *Stem* 2 to 5 feet high, rather stout. *Leaves* numerous, entire, lower 3 to 9 inches long, upper 1 to 3 inches long, ¼ to ⅓ of an inch wide, rough-edged. *Heads* 4 to 20, 1 inch in diameter. *Flowers* bright purple.

* * *Heads* 5 *to* 15-*flowered.*

3. L. SPICATA, Willd. *Blue Blazing Star.*

Smooth or somewhat hairy; *stem* wand-like, very leafy; *leaves* linear or lance-linear, entire smooth, the lower 3 to 5-nerved; *heads* densely crowded in a long spike, nearly sessile, 8 to 12-flowered; *involucre* bell shaped, cylindrical, with slight scarious margins; *achenia* pubescent or smoothish; *pappus* scabrous-plumose.

Moist grounds; rare. Aug. A handsome species, sometimes cultivated, 2 to 5 feet high, mostly stout. *Spike* terminal, 6 to 8 inches long. *Involucre* somewhat resinous. *Heads* numerous, with bright purple flowers.

4. KUHNIA. Linn.

In honor of *Dr. Adam Kuhn*, of Pennsylvania.

Heads 10 to 25-flowered. Scales of the involucre loosely imbricated, lanceolate, in 2 or 3 series. Corolla slender, 5-toothed. Receptacle naked. Pappus in a single series, plumose. Achenia cylindrical, many striate.—*A perennial herb, with mostly alternate lanceolate leaves with resinous dots and whitish flowers in panicled corymbs.*

K. eupatorioides, L. *Thoroughwort-like Kuhnia.*

Leaves varying from linear and entire to broadly lanceolate and toothed; *corymbs* terminal, few-flowered.

Dry soils. Aug., Sept. *Stem* 2 to 3 feet high, slender, somewhat branched, often purple. *Flowers* whitish or pale-yellow.

5. MIKANIA. Willd. Climbing Hemp-weed.

In honor of *Prof. Mikan*, of Prague.

Heads 4 to 6-flowered. Flowers all tubular. Involucre of 4 scales. Receptacle naked. Pappus capillary, simple, scabrous. Anthers partly exserted. Achenia angled.—*Climbing perennials, with opposite mostly heart-shaped leaves and corymbose-panicled flesh-colored flowers.*

M. scandens, *Climbing Bonesett.*

Nearly smooth, twining; *leaves* somewhat triangular heart-shaped or halbert-form, pointed, toothed at the base; *heads* in pedunculate axillary corymbs.

Copses along streams, climbing over bushes; rare. July—Sept. Every part smooth. *Leaves* 2 to 3 inches long, 1 to 2 wide, on petioles 1 to 2 inches long, apex tapering to a long point. *Branches* short, each bearing a small corymb of whitish or pink-colored flowers.

6. CONOCLINIUM. DC. Mist-flower.

Gr. *Conon*, a cone, and *cline*, a bed; referring to the conical receptacle.

Heads many-flowered. Receptacle conical. Involucre bell-shaped. Scales linear-awl-shaped, somewhat imbricated. Corolla 5-toothed. Achenia 5-angled. Pappus a single row of slender capillary bristles.—*Perennial erect herbs, with opposite petioled leaves, and violet-purple flowers in crowded terminal corymbs.*

C. cœlestinum, DC.

Somewhat hairy, much branched: *leaves* triangular-ovate and slightly heart-shaped, crenate-serrate, veiny; *petioles* slender; *corymbs* numerous, sub-umbellate; *scales* numerous, setaceous.

Hedges, thickets and roadsides. Sept. *Stem* 1 to 2 feet high, terete with opposite branches, somewhat tufted. *Leaves* 1 to 2 inches long, ⅔ as wide. *Flowers* 20 to 50 in a head, bluish-purple, fading reddish.

7. EUPATORIUM. Tourn. THOROUGHWORT.

Dedicated to *Eupator Mithridates*, who is said to have used a species of the genus in medicine.

HEADS 3-many-flowered. INVOLUCRE cylindrical or bell-shaped. RECEPTACLE flat, naked. COROLLA 5-toothed. PAPPUS simple, a single row of slender capillary longish bristles. ACHENIA 5-angled.—*Perennial herbs, with opposite or verticillate leaves, corymbose heads, and flowers white, blue, red, &c., never yellow.*

1. E. PURPUREUM, L. *Trumpet-weed.*

Stem tall and stout, simple; *leaves* 3 to 6 in a whorl, oblong-ovate or lanceolate, pointed, very veiny, roughish, finely glandular serrate; *corymbs* very dense and compound with whorled peduncles.

Low grounds; common. July—Sept. *Stem* 6 to 12 feet high, smooth glaucous-purple, striate or fistular spotted or unspotted. *Leaves* in about 12 whorls of 3 to 6s, largest in the middle of the stem, 8 inches long, and 2 wide, on petioles 1 inch long. *Corymbs* often 1 foot in diameter. *Flowers* purple, showy.

* *Heads 5 to 20-flowered; involucre of 7 to 15, more or less imbricated and unequal scales; flowers white; leaves mostly opposite, sessile or nearly so; heads mostly 5-flowered.*

2. E. HYSOPIFOLIUM, L. *Narrow-leaved Thoroughwort.*

Minutely pubescent; *leaves* opposite (the upper ones alternate) often whorled, narrow, linear or lanceolate, elongated, obtuse, 1 to 3-nerved, lower ones subserrate, upper ones entire; *scales of the involucre* obtuse.

Dry fields and sterile soil. Aug., Sept. *Stem* 1 to 2 feet high, branching, with numerous narrow leaves. *Corymb* spreading at the summit. *Heads* 5-flowered. *Flowers* purplish.

3. E. ALTISSIMUM, L. *Tall Thoroughwort.*

Stem tall and stout, pubescent; *leaves* lanceolate, tapering at both ends, subsessile, acutely serrate above the middle, conspicuously 3-nerved; *corymbs* numerous, dense; *heads* 5-flowered; *scales* 8 to 12, obtuse, shorter than the flowers.

Woods and sandy soil. Sept., Oct. *Stem* 3 to 7 feet high. *Leaves* 3 to 4 inches long, ½ to ¾ wide, small ones often fascicled in the axils. *Corollas* whitish, much longer than the scales.

4. E. ALBUM, L. *White-flowered Thoroughwort.*

Stem pubescent; *leaves* ovate-lanceolate, coarsely toothed, veiny; *heads* clustered in the corymb, 5-flowered; *scales of the involucre* closely imbricated, rigid, narrow, pointed, white and scarious above.

Sandy and barren places. Aug.—Oct. *Stem* 2 to 3 inches long, ½ to 1 wide, upper ones entire and alternate. *Heads* very white. *Involucre* concealing the flowers, sprinkled with resinous dots.

5. E. TEUCRIFOLIUM, Willd. *Vervein-leaved Thoro'wort.*

Roughish-pubescent; *leaves* opposite, sessile, ovate-oblong and ovate-lanceolate, rough, veiny, coarsely toothed towards the base, upper ones alternate; *corymb* compound, somewhat panicled with few branches; *heads* 5 to 6-flowered; *scales of the involucre* 10, oblong lanceolate, rather obtuse.

Low grounds. Aug.—Oct. *Stem* 2 to 3 feet high, erect, rather slender. *Leaves* sometimes almost incised; the lower broad at base and closely sessile. *Heads* somewhat clustered, corymbose. *Flowers* white. *Scales* scarious on the margin, white at the tips.

6. E. ROTUNDIFOLIUM, L. *Round-leaved Thoroughwort.*

Downy-pubescent; *leaves* opposite, sessile, roundish-ovate, obtuse, sub-cordate at base, 3-nerved, veiny, roughish, coarsely serrate; *heads* about 5-flowered, in large and dense corymbs; *scales* of the involucre linear-lanceolate, slightly pointed.

Dry soil. Aug., Sept. A slender species 1 to 3 feet high. *Leaves* sprinkled with resinous dots 1 to 2 inches long, ¾ as wide, sometimes almost orbicular, mostly obtuse. *Flowers* white. *Pappus* longer than the corolla. *Styles* much exserted.

7. E. PUBESCENS, Muhl. *Hairy Thoroughwort.*

Pubescent; *leaves* ovate, opposite, sessile, acute, obtusely dentate, somewhat 3-nerved, veiny; *involucre* 7 to 8-flowered, with lanceolate, acute scales.

Dry grounds. Aug., Sept. A large rough plant, 3 to 4 feet high, with the lower branches opposite. *Leaves* thin and slightly scabrous, slightly truncate at the base. *Involucre* of about 12 scales, the outer shortest. *Flowers* white.

8. E. SESSILIFOLIUM, L. *Sessile-leaved Thoroughwort.*

Stem smooth, branching; *leaves* opposite, sessile, distinct, roundish-ovate or lanceolate, somewhat clasping the stems, smooth, serrate; *involucre* 5 to 12-flowered, with oval and oblong obtuse scales.

Rocky woods and banks. Sept. *Stem* slender, erect, branching at top. *Leaves* large, somewhat truncate at base, tapering regularly to a long point, minutely dotted beneath. *Flowers* white, in a widely spreading terminal corymb.

9. E. RESINOSUM, Torr. *Resinous Thoroughwort.*

Minutely velvety-downy; *leaves* linear-lanceolate, elongated, closely sessile or clasping at the base, serrate, slightly veiny beneath; *corymb* fastigiate, compound; *heads* 10 to 15-flowered, with obtuse hoary-tomentose scales.

Wet sandy soils. Aug., Sept. *Stems* 2 to 3 feet high, growing in tufts. *Leaves* 4 to 6 inches long, ¼ to ½ inch wide, membranaceous, viscid with resinous globules. *Heads* very numerous, rather small.

10. E. PERFOLIATUM, L. *Thoroughwort. Bonesett.*

Stem stout, hairy; *leaves* lanceolate, connate-perfoliate, tapering to a slender point, serrate, very veiny; *corymbs* compound; *heads* 8 to 10-flowered, with linear lanceolate scales.

Low grounds, meadows: abundant. Aug. A well known common plant 2 to 4 feet high, hairy or woolly, branched at the top. *Leaves* large, united at the base around the stem, the two measuring from 8 to 14 inches in length. *Heads* in large clustered corymbs. *Flowers* white. Medicinal.

* * *Leaves opposite; flowers white,* 8 to 30 *in a head.*

11. E. AGERATOIDES, L. *Nettle-leaved Thoroughwort.*

Smooth, branching; *leaves* opposite, on long petioles, broadly ovate, pointed, coarsely and sharply toothed; *heads* 12 to 20-flowered, with narrow lanceolate scales; *corymbs* compound.

Rich woods and rocky hills; common. Aug., Sept. *Stem* 2 to 3 feet high, somewhat branched. *Leaves* on petioles 1 to 2 inches long, sometimes slightly cordate, 3 to 6 inches long, 2 to 4 wide. *Heads* numerous, in small clusters, forming a compound corymb. *Flowers* pure white, somewhat fragrant.

12. E. AROMATICUM, L. *Aromatic Thoroughwort.*

Smooth or nearly so; *stem* terete pubescent, nearly simple; *leaves* opposite, on short petioles, ovate, rather obtusely toothed, acuminate, 3-nerved; *corymb* somewhat panicled; *heads* about 20-flowered.

Low woods. Aug., Sept. *Stem* about 2 feet high. *Leaves* 2 to 4 inches long, 1 to 2 wide, on petioles ½ to 1 inch long. *Heads* of the flowers large. *Involucre* with 10 to 12 linear, acute, equal scales. *Flowers* in small corymbs, large, white, and aromatic.

SUB-TRIBE 2. TUSSILAGINEÆ.

Heads radiate; flowers dissimilar, or diœcious.

8. NARDOSMIA. Cass.

Gr. *nardos*, spikenard, and *osmæ*, odor.

HEADS many-flowered, somewhat diœcious. STERILE FLOWERS of the ray in a single series, ligulate, pistilate, those of the disk tubular. FERTILE FLOWERS with many rows of minutely ligulate ray-flowers, and a few tubular perfect ones in the centre. RECEPTACLE flat. ACHENIA terete. PAPPUS of soft capillary bristles, longest and most copious in the fertile flowers.—*Perennial woolly herbs, with radical leaves, the scape with sheathing scaly bracts, and the heads of purplish fragrant flowers in a corymb.*

N. PALMATA, Hook. *Palmate Sweet Colt's-foot.*

Leaves rounded or kidney-form, palmately 5 to 7-lobed, the lobes toothed and cut, white, woolly beneath.

Swamps; rare. May. *Scape* 1 to 2 feet high, stout, clothed with numerous sheathing scales. *Leaves* large, 6 to 10 inches broad. *Heads* numerous, in a corymbose thyrse.

9. TUSSILAGO. Tourn. COLT'S-FOOT.

Lat. *tussis*, a cough, for which the plant is a reputed remedy.

HEADS many-flowered. RAY FLOWERS narrowly ligulate; *pistillate*, fertile, in many rows; the *tubular disk flowers* few, staminate. SCALES OF THE INVOLUCRE nearly in a single row. RECEPTACLE flat. FERTILE ACHENIA cylindric-oblong. PAPPUS capillary, copious, in the fertile flowers.—*A low perennial, with horizontal creeping rootstocks, radical leaves, and simple scaly scapes bearing a single head of yellow flowers.*

T. FARFARA, L. *Common Colt's-foot.*

Leaves rounded-heart-shaped, radical; *flowers* with very narrow rays.

Wet places, brooksides. A low plant sending up a single scape about 5 inches high in March or April, with a single, terminal, many-rayed head of yellow flowers before a leaf is to be seen. *Leaves* arising after the flowers are withered, 4 to 5 inches broad, cordate angular, toothed, dark-green above, woolly underneath, on long petioles.

TRIBE 3. ASTEROIDEÆ. THE ASTER TRIBE.

Heads radiate, rarely discoid; branches of the style more or less flattened and linear, minutely and equally pubescent above; leaves mostly alternate.

SECTION 1. *Heads radiate; rays cyanic.*

10. ASTER. Linn. STARWORT. ASTER.

Gr. *astro*, a star; from the appearance of the radiate heads of flowers.

HEADS many-flowered; *ray-flowers* in a single series, fertile; *disk flowers* tubular, perfect. SCALES OF THE INVOLUCRE more or less imbricated, often with leaf-like tips. RECEPTACLE flat, alveolate (honey comb-like). ACHENIA usually more or less flattened. PAPPUS simple, of capillary bristles.—*Perennial herbs, with alternate leaves, corymbed, panicled or racemose heads of flowers, with white blue or purple rays, and yellow disk, often changing to purple.*

1. BIOTIA, DC. *Scales imbricated with appressed greenish tips; rays* 6 *to* 15 (white or nearly so); *lower leaves large, heart-shaped, petiolate; heads in open corymbs.*

1. A. CORYMBOSUS, Ait. *Corymbed Aster.*

Stem slender; *leaves* ovate, mostly cordate, coarsely and unequally serrate, acuminate, petioled; *heads* loosely corymbose; *rays* 6 to 9.

Dry woods: common. July, Aug. *Stem* 1 to 2 feet high. *Leaves* thin, large, *lower ones* heart-shaped, pointed; *middle ones* ovate; upper becoming lanceolate. *Flowers* in a broad flat-topped corymb, large, very open, with long, narrow, white rays.

2. A. MACROPHYLLUS, L. *Large-leaved Aster.*

Stem stout, branched, diffuse; *leaves* rough, thickish, serrate; *lower* and *radical ones* on long petioles, cordate; *upper* on winged petioles or sessile; *heads* in large corymbs; *rays* 12 to 25.

Woods; common. Aug., Sept. *Stem* 2 to 3 feet high, rigid, the branches rough, downy above. *Lower leaves* 4 to 10 inches long, and 3 to 6 inches wide on somewhat winged petioles. *Heads* in a spreading terminal corymb. *Scales of the involucre* oblong-lanceolate, obtuse. *Rays* white or pale-blue.

2. CALLIASTRUM, T. & G. *Scales imbricated with spreading green tips; rays* 12 *to* 30, *violet; achenia narrow, smoothish; pappus rigid, of unequal thickness; heads full, large and showy; stem-leaves all sessile; lower ones not cordate.*

3. A. RADULA, Ait. *Rough-leaved Aster.*

Stem erect, simple below, angular, smooth; *leaves* oblong-lanceolate, pointed, simple, sharply serrate, rough on both sides and rugose-veined; *involucre* bell-shaped, with oblong appressed scales, and small spreading green tips; *achenia* smooth, linear-oblong.

Bogs and low grounds; rare. Aug., Sept. *Stem* 1 to 3 feet high, very leafy, with a few spreading undivided branches at the summit, purplish, each bearing a single large head, rarely more. *Leaves* 2 to 3 inches long, nearly equal throughout. *Involucre* nearly smooth, except the ciliate margins. *Rays* light violet-purple.

4. A. SPECTABILIS, Ait. *Showy Aster.*

Stem erect, minutely rough and glandular-pubescent at the summit; *leaves* oblong-lanceolate, very rough, upper sessile and entire, lower ones serrate in the middle; *branches* corymbose; *heads* hemispherical, with numerous linear-oblong obtuse scales, and conspicuous spatulate downy tips; *achenia* slightly pubescent.

Sandy soil. Aug.—Nov. *Stem* 2 to 4 feet high, branched above into a nearly simple corymb of 10 to 15 heads. *Rays* about 20 in a head, narrowly-lanceolate, nearly 1 inch long, very deep-violet blue. Probably the handsomest of the genus.

3. ASTER *proper. Scales green or with green tips: rays numerous; pappus bristles soft and nearly uniform; achenia flattened.*

5. A. CONCOLOR, L. *Silky Aster.*

Stem nearly simple, wand-like; *leaves* oblong or lanceolate, crowded, appressed, the upper appearing like small bracts; *heads* in a simple or compound virgate raceme; *involucre* obovoid, with closely imbricated, appressed, somewhat rigid, lanceolate, silky scales, in several rows; *achenia* silky.

Dry sandy soil. Aug.—Nov. A handsome plant 1 to 3 feet high, sparingly branched. *Leaves* 1 inch in length, ⅓ as wide, reduced in size upwards, greyish-silky, and of the same hue on both sides. *Heads* middle-sized, in a long raceme, showy. *Rays* bright violet-purple. *Pappus* rust-colored.

3. * *Lower leaves not heart-shaped; the upper all sessile and more or less clasping by a cordate or auricled base; rays large, deep purple or blue.*

6. A. PATANS, Ait. *Spreading Aster.*

Rough-pubescent; *stem* simple, paniculate above; *leaves* oblong-lanceolate or ovate-oblong, generally contracted below the middle; *panicle* loose, few-flowered; *scales* imbricate, lanceolate, loose.

Dry grounds; common. Aug.—Nov. *Stem* 2 to 3 feet high, slender, branching into a loose terminal panicle above. *Leaves* large, 3 to 6 inches long below, becoming small and bract-like on the branches, all clasping by a deep auricled-heart-shaped base, rough. *Heads* solitary, on the ends of the leafy branchlets, large, with 20 to 30 violet-colored rays.

7. A. LÆVIS, L. *Smooth Blue Aster.*

Very smooth, glaucous; *stem* angular; *leaves* lanceolate or ovate-lanceolate, thickish, mostly entire, shining; *involucre* closely imbricate, with broadly-linear, thick and rigid scales; *achenia* smooth.

Rich woodlands and banks; common. Sept.—Nov. A very small and beautiful species, 2 to 3 feet high. *Stem* polished, green. *Leaves* rather fleshy, the upper more or less clasping by an auricled or heart-shaped base. *Heads* in a close panicle, large and showy, with numerous rays of a fine bright sky-blue, becoming purple, and triangular green tips.

4. * * *Lower leaves all heart-shaped and petioled, conspicuously serrate; rays bright blue, pale or nearly white.*

8. A. CORDIFOLIUS, L. *Heart-leaved Aster.*

Stem much branched above, smooth; *lower leaves* all heart-shaped, on slender petioles; *involucre* inversely conical, with closely imbricate appressed scales, tipped with short obtuse or acutish points.

Woodlands; very common. Sept., Oct. *Stem* 2 to 4 feet high, smoothish below, more or less pubescent above. *Leaves* varying from heart-shaped to narrow-ovate. *Lower leaves* more or less winged, on hairy petioles. *Upper leaves* gradually reduced to small bracts. *Heads* very numerous, in racemed panicles, rather small, angled on the spreading branches. *Rays* 10 to 15, pale-blue varying to white.

9. A. SAGITTIFOLIUS, Willd. *Arrow-leaved Aster.*

Stem erect, rigid, with racemose ascending branches; *leaves* ovate-lanceolate, pointed, serrate in the middle; *lower ones* cordate-sagittate, on slender narrowly-winged petioles; *involucre* oblong, with closely imbricate linear-subulate scales.

Dry woods. Aug.—Oct. *Stem* 2 to 4 feet high, with erect branches above, bearing numerous racemose heads, forming a compound panicle of racemes. *Heads* small, almost sessile, each with about 12 bluish or white rays.

10. A. UNDULATUS, L. *Wave-leaved Aster.*

Pale or somewhat hoary with close pubescence; *stem* spreading; *leaves* ovate or lanceolate, with wavy or slightly-toothed margins; *heads* numerous, in racemose panicles; *involucre* obovoid, with closely imbricate scales.

Dry woods; common. Sept., Oct. *Stem* 2 to 3 feet high, spreading, bearing numerous heads in racemose panicles. *Lower leaves* heart-shaped, on long winged petioles, which are dilated and clasping at the base, or directly sessile by a heart-shaped base. *Heads* middle-sized, with violet-blue rays and yellow disks, at length becoming purple.

5. * * * *Lower leaves never heart-shaped; those of the stem sessile or clasping; heads small or middle-sized; rays white or pale bluish-purple.*

11. A. ERICOIDES, L. *Heath-leaved Aster.*

Smooth or sparingly hairy; *lower leaves* oblong-spatulate, sometimes toothed; the *upper ones* linear lanceolate or linear awl-shaped, acute at both ends; *scales of the involucre* imbricate, linear obtuse, somewhat squarrose.

Dry open places. Aug.—Oct. *Stem* 1 to 3 feet high, with the simple branchlets or peduncles racemose along the upper side of the wand-like spreading branches. *Leaves* very numerous and somewhat rigid, those of the stem 3 inches in length. *Heads* small, about 20-rayed. *Rays* white or pale purple. *Disk* at length purplish

12. A. MULTIFLORUS, Ait. *Many-flowered Aster.*

Hoary with minute pubescence; *leaves* crowded, linear, entire, with rough or ciliate margins, somewhat 3-nerved; these of the branchlets spreading and partly clasping at the base; *involucre* linear or spatulate with loosely imbricate oblong, ciliate, squarrose scales.

Dry gravelly or sandy soil; common. Sept., Oct. *Stem* about 2 feet high, with numerous spreading racemose branches, usually covered with a dense white pubescence. *Leaves* 1 to 2 inches long, obtuse, very narrow. *Heads* small, in crowded terminal racemes, on horizontal branches. *Rays* white or purplish. *Disk* at length purplish.

6. * * * * *Leaves none of them heart-shaped; heads small or middle-sized; rays white or pale buish-purple.*

13. A. DUMOSUS L. *Bushy Aster.*

Nearly smooth; *leaves* linear entire or remotely serrate, rough on the margin sessile; those of the branches smaller and acute; *involucre* inversely conical or bell-shaped, with closely imbricated, linear-spatulate, obtuse scales.

Thickets in dry or moist soil; common. Aug.—Oct. A variable species 1 to 3 feet high. *Stem* loosely branched, racemosely compound, with the scattered heads mostly solitary at the end of the spreading branchlets. *Leaves* decreasing in size to the branchlets, the upper small. *Rays* pale-purple or blue.

14. A. TRADESCANTI, L. *Tradescant's Aster.*

Smoothish; *leaves* sessile, smooth, with rough margins; *cauline* linear-lanceolate pointed; *involucre* with imbricated, narrowly-linear, acute scales in 3 to 4 rows.

Var. FRAGILIS; *leaves* entire or nearly so, except the lowest; *heads* more scattered on the branchlets.

Moist banks, fields, &c.; very common. Aug.—Oct. *Stem* 2 to 4 feet high, smooth, bushy, the numerous heads closely racemed along the erect spreading or diverging branches. *Lower stem leaves* about 4 inches long, narrowly lanceolate, remotely serrate in the middle with fine sharp teeth, gradually reduced in size upwards. *Heads* small, very numerous. *Rays* white or pale-purple.

15. A. MISER, L. *Starved Aster.*

More or less hairy; *stem* much branched; *leaves* lanceolate, pointed or acuminate at each end, sharply serrate in the middle; *involucre* imbricated with linear, acute or rather obtuse scales in 3 or 4 rows.

Thickets, fields, &c.; very common. Aug.—Oct. A very variable species, varying in height from 8 to 10 inches to 3 to 4 feet, erect or diffuse. *Stem* very branching or nearly simple, the branches usually diverging, bearing racemose often scattered heads. *Leaves* varying from narrow-lanceolate to broad-ovate, 1 to 5 inches in length. *Heads* usually numerous, with short, inconspicuous pale bluish-purple or white rays.

16. A. SIMPLEX, Willd. *Simple Aster.*

Nearly smooth; *stem* tall and much branched; *leaves* lanceolate, pointed, the lower serrate; *involucre* loosely imbricate with linear awl-shaped scales.

Shady moist banks; common. Aug.—Oct. Another variable species from 1 to 5 feet high, the branches and scattered heads somewhat corymbose at the summit. *Leaves* sessile, 2 to 4 inches long, ½ to 1 inch wide, tapering to a slender point, those of the branches small in proportion. *Heads* middle-size, loosely racemose or a little crowded on the short branchlets. *Rays* pale purple. *Disk* yellowish, at length purple-brown.

17. A. TENUIFOLIUS, L. *Slender-leaved Aster.*

Nearly smooth; *leaves* linear-lanceolate, tapering into a long slender point; *lower* somewhat serrate in the middle; *involucre* hemisperical, with closely imbricated, numerous, linear-awl-shaped, acute scales; *heads* in panicles or racemes.

Low grounds. Aug.—Nov. *Stem* 2 to 5 feet high, mostly stout, much branched. *Stem leaves* 2 to 6 inches long, smaller in proportion on the branches and branchlets. *Heads* small or middle-sized. *Rays* 20 to 30, short and narrow, pale purple or whitish.

18. A. CARNEUS, L. *Flesh-colored Aster.*

Smooth, rough or pubescent; *stem* much branched; *leaves* lanceolate, pointed; upper short and partly clasping; *involucre* obovate, with closely imbricated, lanceolate, abruptly acute scales; *heads* racemose along the ascending leafy branches.

Moist soils; rare. Sept., Oct. A handsome bushy species, very variable, about 2 feet high. *Stem* often purple. *Leaves* firm in texture, smooth or rough above, those of the stem 3 to 5 inches long, ½ inch wide, those of the branches much smaller. *Heads* numerous, middle-sized, somewhat 1-sided on the branches. *Rays* 20 to 30, rather long, flesh-colored or nearly white.

6. ***** *Stem leaves sessile, the upper more or less clasping; heads middle-sized or large; rays blue or purple.*

19. A. LONGIFOLIUS, Lam. *Long-leaved Aster.*

Smooth or nearly so; *stem* branched; *leaves* lanceolate or linear, entire or sparingly serrate in the middle, acuminate, shining above; *involucre* imbricate with linear scales in 3 to 5 rows, crowned with acute or awl-shaped spreading or recurved green tips; *heads* in corymbose panicles at the summit.

Moist places along streams; common. Nov. *Stem* 3 to 6 feet high. *Leaves* variable in form, the lower sometimes ovate-lanceolate, pale beneath, both sides smooth, 4 to 6 inches long. *Heads* numerous, large and showy, with 25 to 30 large bright purplish-blue rays. This variable plant includes several nominal species, including A. laxus, Willd., A. præaltus, Poir., and A. elodes, Torr. & Gray.

20. A. PUNICEUS, L. *Rough-stemmed Aster.* *Cocash.*

Stem hispid, stout; *leaves* oblong-lanceolate, clasping by an auricled base, coarsely serrate in the middle; *involucre scales* loose, narrowly linear, acute, equal in about 2 rows; *heads* in panicles.

Low thickets and swamps; common. Aug.—Oct. *Stem* 3 to 6 feet high, usually purple and very rough with rigid bristly hairs. *Leaves* sparingly toothed in the middle, rough above, nearly smooth beneath. *Heads* large and showy. *Rays* 50 to 80, long and narrow, lilac-purple or bluish.

21. A. PRENANTHOIDES, Muhl. *Prenanthes-like Aster.*

Stem low, and with the branches hairy in lines; *leaves* spatulate-lanceolate or ovate-lanceolate, incisely serrate in the middle; *involucre* imbricated, with narrowly linear scales, crowned with recurved spreading tips; *heads* in corymbose panicles.

Moist woods. Sept., Oct. *Stem* 1 to 3 feet high, sparingly branched. *Leaves* conspicuously acuminate, tapering below into a long contracted entire portion, which is abruptly dilated into an auricled-heart-shaped clasping base; *branch leaves* smaller, nearly entire. *Heads* about middle-size, rather few, clustered towards the ends of the branches. *Rays* violet, lilac or light-blue.

22. A. NOVÆ ANGLIÆ, L. *New England Aster.*

Stem stout, hairy; *leaves* very numerous, lanceolate, acute, entire, auriculate-clasping, roughish pubescent; *involucre-scales* linear-awl-shaped, loose, equal, nearly in a single row, viscid, as long as the disk; *heads* in a loose terminal panicle; *achenia* hairy.

Moist grounds; common. Sept.—Nov. *Stem* 3 to 6 feet high, almost hisped, with spreading branches. *Heads* showy, large, crowded in close corymbs. *Rays* violet-purple, sometimes rose-purple, very numerous.

23. A. OBLONGIFOLIUS, Nutt. *Oblong-leaved Aster.*

Stem rigid, much branched above; *leaves* narrowly oblong or lanceolate, mucronately pointed, entire, partly clasping, roughish: *involucre* imbricated with broadly linear scales appressed at the base, crowned with long and spreading foliaceous tips; *heads* in corymbose panicles; *achenia* canescent.

Banks of the Juniata, Huntingdon Co. *Dr. Porter!* in Gray's Flora. *Stem* 1 to 2 feet high, with the branchlets, the uppermost leaves and involucre minutely roughish-glandular with resinous dots. *Leaves* 1 to 2 inches long, ¼ to ½ wide. *Heads* fewer and much smaller than in A. Novæ Angliæ. *Rays* violet-purple.

4. ****** ORTHOMERIS, Torr. & Gray.—*Scales imbricated, with membranaceous margins, destitute of green tips; pappus of soft and unequal capillary bristles.*

24. A. ACUMINATUS, Michx. *Pointed-leaved Aster.*

Somewhat hairy; *stem* simple, flexuous, angular; *leaves* oblong-lanceolate acuminate, serrate; *involucre* imbricated with linear-lanceolate, pointed, thin scales; *heads* in corymbose panicles.

Mountains and woods. Aug. *Stem* about 1 foot high. *Leaves* conspicuously pointed, coarsely toothed above, wedge-form and entire at the base, 3 to 5 inches long. *Panicle* corymbose, terminal, few-flowered, nearly or quite naked. *Heads* rather large with 12 to 18 long, white, often tinged with purple rays.

5. ******* OXYTRIPOLIUM, DC.—*Pappus soft and capillary; achenia striate; leaves thickish or succulent.*

25. A. FLEXUOSUS, Nutt. *Perennial Salt Marsh Aster.*

Stem very smooth, flexuous, sparingly branched; *leaves* linear; *lower* lance-linear thick and fleshy, pointed, entire; *involucre* bell-shaped, with ovate-lanceolate imbricated scales in many rows; *heads* large, terminal on the ends of the branches; *rays* numerous, shorter than the involucre.

Salt marshes. Sept.—Nov. *Stem* 1 to 2 feet high, with the whole plant very smooth, usually with a few spreading branches at the summit. *Heads* large, 1 to 2 on the branchlets. *Rays* numerous, large, pale purple. *Disk* yellow.

26. A. LINIFOLIUS, L. *Annual Salt Marsh Aster.*

Smooth; *stem* much branched, erect, spreading; *leaves* linear-lanceolate, pointed, entire, flat, on the branches awl-shaped; *involucre* oblong, with linear awl shaped scales in few rows; *heads* in racemes or panicles.

Salt marshes. Aug.—Oct. *Stem* 12 to 18 inches high, thick, smooth, reddish, very branching. *Leaves* smooth, sessile. *Heads* small, in a loose terminal panicle. *Rays* somewhat in two rows, short, not projecting beyond the disk, more numerous than the disk flowers, pale purple or nearly white.

10. GALATELLA. Cass.

HEADS many-flowered, the rays few, sterile. INVOLUCRE shorter than the flowers, the *scales* closely imbricated in 3 or 4 rows, the outer often 3-nerved. RECEPTACLE alveolate.

ACHENIA oblong, silky-hairy. PAPPUS of copious capillary bristles.—*Perennial plants with straight stems, narrow 1 to 3 nerved, rather rigid entire leaves, often dotted, and flowers with purple or pale rays, and a yellow disk.*

1. G. HYSSOPIFOLIA, Nees. *Hyssop-leaved Galatella.*

Stem erect, corymbose at the summit; *lower leaves* lanceolate-linear, acute, dotted, entire, rough, 3-nerved; *branch leaves* linear-subulate, 1-nerved; *involucre scales* acutish; *rays* elongated.

Sandy fields and open woods. Aug.—Oct. *Stem* 1 to 2 feet high, smooth, with spreading branches, terminated with a single head. *Rays* 5 to 10, white or pale purple. The *G. linifolia* of Nees is perhaps only a variety of this species.

11. ERIGERON, Linn. FLEABANE.

Gr. *er, the spring,* and *geron, an old man*; because it is hoary early in the season.

HEADS many-flowered, mostly hemispherical; the *ray flowers* numerous, very narrow, pistillate; those of the *disk* tubular, perfect. SCALES OF THE INVLOUCRE narrow, nearly equal and almost in a single row. RECEPTACLE naked, flat. ACHENIA flattened, usually pubescent and 2-nerved. PAPPUS mostly simple.—*Herbs with alternate leaves, mostly sessile, entire or toothed, and solitary or corymbed flowers with white or purple rays.*

* *Rays not exceeding the disk.*

1. E. CANADENSE, L. *Horse-weed. Butter-weed.*

Bristly-hairy; *stem* erect, wand-like; *leaves* linear or lance-linear, mostly entire ciliate, lower sometimes serrate; *heads* small, very numerous, panicled; *rays* crowded, scarcely longer than the cylindric involucre.

Fields and waste places, very common. July—Nov. A common annual weed of no beauty, growing everywhere, from 6 inches to 6 feet high, mostly very hairy. *Leaves* very narrow with rough edges. *Flowers* small, white, of mean appearance, irregularly racemose upon the branches, and forming a large oblong panicle. The plant varies greatly in size, according to the soil.

* * *Rays longer than the disk.*

2. E. BELLIDIFOLIUM, Muhl. *Robin's Plantain.*

Hairy; *radical leaves* obovate and spatulate, sparingly toothed; *stem-leaves* sessile; distant, lance-oblong, partly clasping, entire; *heads* few, large, corymbose; *rays* 50 to 100, twice as long as the involucre. Perennial.

Shady woods and moist banks, common. May. *Stem* 1 to 2 feet high, producing offsets from the base, rather naked above, bearing 1 to 9 large heads, on slender peduncles. *Leaves* 2 to 3 inches by ½ to ¾ mostly widest above the middle. *Rays* bluish-purple sometimes nearly white.

3. E. PHILADELPHICUM, L. *Philadelphia Fleabane.*

Hairy; *stem* leafy; *lower leaves* wedge-obovate, sometimes obtusely serrate or incisely toothed; *upper* clasping, usually entire; *heads* few, on elongated peduncles; *rays* very numerous, 150 to 200. Perennial.

Woods and fields, common. Aug., Sept. *Stem* slender, 1 to 3 feet high, loosely corymbed at the summit, bearing several small heads. *Leaves* 2 to 4 inches long by ½ to ¾ wide. *Rays* reddish-purple or flesh-colored, very narrow.

4. E. ANNUUM, Pers. *Daisy Fleabane.*

Sparsely hairy; *stem* tall; *lower leaves* ovate, obtuse, coarsely toothed, tapering into a margined petiole; *upper leaves* ovate-lanceolate, acute and entire at both ends; *rays* very narrow. Annual.

Fields and meadows; very common. June—Oct. *Stem* 3 to 5 feet high, stout, angular, more or less hirsute, bearing numerous corymbed heads. *Rays* 100 or more, white, tinged with purple, scarcely the length of the somewhat hisped involucre.

5. E. STRIGOSUM, Muhl. *Strigose Fleabane.*

Stem slender, hairy; *leaves* toothed or entire; *lower* spatulate-lanceolate, 3-nerved tapering to a long narrow petiole; *upper* lanceolate; *heads* in panicled corymbs *rays* narrow-linear.

Fields and meadows; common. June—Aug. *Stem* 1 to 3 feet high, angular, furrowed with short stiff hairs, and bearing a large, loose corymb. *Rays* white, twice the length of the minutely hairy involucre. Plant smaller and more simple than the last, but with longer rays.

12. DIPLOPAPPUS, Cass.

Gr. *diploos*, double, and *pappus*, *pappus*, the character which distinguishes the genus from Aster.

HEADS many-flowered; *ray flowers* 8 to 12 in a single series, pistillate; those of the disk tubular, perfect. INVOLUCRE with imbricated, appressed, lanceolate or awl-shaped *scales*, 1-nerved or keeled, destitute of herbaceous tips. RECEPTACLE flat, alveolate (honey-comb-like). ACHENIA flattish. PAPPUS double, the outer very short, subulate, the inner long, capillary.—*Perennials with entire alternate leaves, and corymbose or simple heads of flowers with cyanic rays and yellow disks.*

1. D. LINEARIFOLIUS, Hook. *Violet Diplopappus.*

Stem erect, or somewhat decumbent, roughish; *leaves* rigid, spreading, linear, strongly 1-nerved, smooth, with very rough margins; *heads* terminating the simple slightly hoary branches.

Dry soil. Aug., Sept. A handsome species 8 to 20 inches high, several from the same woody root, very leafy, purplish. *Leaves* numerous, rigidly upright or recurved, obtuse, pale beneath, shining above. *Heads* large for the size of the plant, solitary and terminal on the branches, with long showy violet-colored rays.

2. D. UMBELLATUS, Torr. & Gray. *Umbelled Diplopappus.*

Smooth, leafy at the top; *leaves* lanceolate, elongated, acuminate and tapering at the base; *heads* very numerous; *scales of the involucre* closely imbricated, obtusely lanceolate.

Moist thickets, river banks. Aug., Sept. *Stem* 2 to 5 feet high, bushy at the top. *Leaves* somewhat rough above, smooth beneath, 3 to 6 inches long, narrow, those of the branches smaller. *Heads* numerous, in a level-topped corymb. *Rays* about 12, white.

3. D. AMYGDALINUS, T. & G. *Almond-leaved Diplopappus.*

Smooth or roughish above, leafy; *leaves* ovate-lanceolate, acute, abruptly narrowed at the base; *heads* numerous; *scales of the involucre* loosely imbricated, obtuse.

Low grounds. Aug. Resembling the last, usually lower, rough, and with broader and shorter leaves.

4. D. CORNIFOLIUS, Darl. *Cornel-leaved Diplopappus.*

Stem slender, low, pubescent and loosely panicled above; *leaves* elliptical or ovate-lanceolate, acuminate, ciliate-hirsute on the margin, hairy on the veins beneath.

Woods. July—Sept. *Stem* 1 to 2 feet high. *Leaves* conspicuously pointed at both ends, pale beneath on very short stalks. *Heads* usually few, on rather rigid peduncles. *Rays* white.

13. BOLTONIA, L'Her.

In honor of *J. Bolton*, a botanist of the last century.

HEADS many-flowered, the *ray-flowers* numerous, pistillate; those of the *disk* tubular, perfect. INVOLUCRE hemispherical with imbricated appressed scales, somewhat in 2 rows, crowned with narrow membraneous margins. RECEPTACLE conical, punctate. ACHENIA flat 2 or 3 winged. PAPPUS of several minute bristles with 2 to 4 longer awns.—*Smooth branching perennial herbs, with lanceolate entire, sessile leaves, and loosely corymbose heads of flowers, with white or purplish rays.*

1. B. ASTEROIDES, L'Her. *Aster-like Boltonia.*

Leaves entire or obscurely serrate; *pappus* of few minute bristles and no awns; *achenia* broadly oval.

Moist places, along streams. July—Aug. *Stem* 3 to 6 feet high, with a diffusely branched summit. *Leaves* 2 to 6 inches long by ¼ to ½ wide, reduced upwards to setaceous bracts 1 to 2 inches in length. *Heads* terminal on the filiform bractlets. *Rays* purple, ½ inch long.

2. B. GLASTIFOLIA, L'Her. *Glaucous Boltonia.*

Leaves lanceolate, somewhat glaucous; *pappus* of several short bristles, and 2 or 3 more or less prolonged awns; *achenia* obovate, broadly winged.

Rich moist soil. Sept. *Stem* 3 to 7 feet high. *Stem leaves* 2 to 4 inches long by ¼ to ¾ wide, those of the branches smaller. *Heads* in a loose corymb. *Rays* purplish, ¾ of an inch long. *Disk* yellow.

14. SERICOCARPUS, Nees.

Gr. *serikos*, silky, and *karpos*, fruit.

HEADS 12 to 15-flowered; *ray-flowers* 4 to 8 pistillate; *disk-flowers* 6 to 10, perfect. INVOLUCRE oblong or club-shaped, closely imbricated with appressed cartilaginous scales in several rows with short and abrupt green tips. RECEPTACLE alveolate-toothed (honey-comb-like). ACHENIA short, obconic, very silky. PAPPUS simple, of capillary bristles.—*Perennial tufted herbs, with sessile alternate leaves, and small clustered heads of flowers with white rays and yellow disks, disposed in a flat corymb.*

1. S. SOLIDAGINEUS, Nees. *Narrow-leaved Sericocarpus.*

Smooth; *stem* erect, slender; *leaves* linear, rigid, obtuse, entire, with rough margins obscurely 3-nerved, tapering to the base; *heads* very small, in close clusters, few-flowered; *rays* slender.

Woods and low places; rare. Aug., Sept. *Stem* simple, about 2 feet high, often several from the same root. *Leaves* smooth, pale green, 1 to 2 inches long, ¼ to ½ inch wide. *Heads* in a flat-topped corymb. *Rays* white, longer than the disk. *Pappus* white.

2. S. CONYZOIDES, Nees. *Broad-leaved Sericocarpus.*

Slightly pubescent; *leaves* oblong-lanceolate or the lower spatulate, obscurely 3-nerved, smooth beneath, acute at each end, ciliate; *lower* serrate towards the apex; *involucre* top-shaped; *heads* rather loosely corymbed; *rays* short.

Dry woods; common. July—Sept. *Stem* 1 to 2 feet high, somewhat 5-angled, rigid, but rather slender. *Leaves* somewhat fleshy. *Heads* few in small clusters. *Rays* longer than the disk, white.

15. CALLISTEPHUS, Cass.

Gr. *kallos*, beautiful, and *stephos*, a crown.

RAY-FLOWERS pistillate, numerous; *disk-flowers* perfect. INVOLUCRE hemispherical. RECEPTACLE sub-convex. PAPPUS double, each in one series, *outer series* short, chaffy, bristly, with the bristles united into a crown; *inner series* of long, thread-like, rough, deciduous bristles.—*Exotic annuals with alternate leaves and showy heads of flowers.*

1. C. CHINENSIS, Nees. *China Aster. Queen Margaret.*

Stem hisped; *branches* divergent, 1-flowered; *leaves* ovate, coarsely dentate, petiolate; *stem leaves* sessile, wedge-shaped at the base.—Native of China. Cultivation has produced many beautiful varieties, double and semi-double, with white, blue, red, flaked and mettled rays. *Stem* 15 to 20 inches high, with long branches, each terminated by a single large head. *Disk* yellow. July—Sept.

16. DAHLIA, Linn.

In honor of *Andrew Dahl*, a Swedish botanist.

INVOLUCRE double, the outer series of many distinct scales, the inner of 8 scales united at base. RECEPTACLE chaffy. PAPPUS none.—*Showy Mexican perennial plants, with opposite pinnate leaves, and showy large heads of flowers.*

1. D. VARIABILIS, Desf. (D. *superflua. Ait.*)

Stem green; *raches of the leaves* winged; *leaflets* ovate, acuminate, serrate, puberulent or nearly smooth; *outer involucre* reflexed; *ray-flowers* pistillate, sterile or fertile.—*Stem* 2 to 4 feet high. *Leaves* coarse and roughish resembling those of the common *elder*. *Flowers* large and beautiful, sporting into innumerable varieties, single and double, of every conceivable shade of white, scarlet, crimson, purple, red, rarely yellow, blooming from Aug. until arrested by frost.

2. D. COCCINEA, Cav. (D. *frustranea. Ait.*)

Stem frosty, or hoary, hollow; *leaves* with the *rachis* naked; *leaflets* roughish beneath; *outer involucre* spreading; *rays* neutral.—*Stem* 3 to 4 feet high. *Leaves* glaucous. *Rays* scarlet, orange-colored or yellow, never purple or white.

SECTION 2. *Heads radiate; rays yellow.*

17. SOLIDAGO, Linn. GOLDEN-ROD.

Lat. *solido*, to join, or make whole; in allusion to its reputed vulnary properties.

HEADS few, or many-flowered. RAYS 1 to 16, pistillate. RECEPTACLE small, alveolate (honey-comb-like). SCALES OF THE OBLONG INVOLUCRE imbricated appressed. ACHENIA many-ribbed, nearly round. PAPPUS simple, of equal capillary bristles.—*Perennial herbs with stems branching near the top, wand-like; alternate leaves, and small heads of yellow (one species whitish) flowers expanding in the autumnal months.*

* *Stems much branched, corymbose; leaves all linear, entire, sessile.*

1. S. LANCEOLATA, Ait. *Bushy Golden-rod.*

Stem angular, hairy, much branched; *leaves* lance-linear, 3 to 5 nerved, rough-margined; *heads* obovoid-cylindrical, in dense corymbed clusters; *rays* 15 to 20.

Woods and meadows; common. Sept. *Stem* 2 to 4 feet high, terminating in a flat-topped corymb. *Leaves* numerous, long and narrow, distinctly 3-veined, acutely pointed. *Flowers* in terminal crowded clusters. Whole plant somewhat fragrant.

* * *Stem simple, corymbose above; lower leaves oval or lanceolate, petiolate.*

2. S. RIGIDA, L. *Rigid Golden-rod.*

Rough and somewhat hoary; *stem* stout, erect, very leafy; *lower leaves* oval, crenate-dentate, rigid; *upper* ovate-oblong, sessile, entire, veiny, thick and rigid; *heads* about 3 to 4 flowered, large, in compact erect racemes; *rays* 7 to 10.

Dry fields and rocky woods. Aug., Sept. A tall species, 3 to 5 feet high, very pubescent when young. *Leaves* rigid, the radical ones sometimes near a foot long. *Heads* very large, many-flowered, clustered near the summits of the branches. *Rays* deep yellow.

* * * *Heads in glomerate axillary clusters.*

3. S. SQUARROSA, Muhl. *Large spiked Golden-rod.*

Stem stout, simple, densely pubescent above; *leaves* smooth, oblong or the lower spatulate-oval, serrate, veiny; *scales* squarrose with spreading green tips; *heads* many-flowered.

Rocky wooded hills. Sept. *Stem* 3 to 5 feet high. *Lower leaves* large, tapering into a margined petiole. *Heads* in dense axillary clusters, forming a long leafy compound spike. *Rays* 10 to 12, elongated, bright yellow.

4. S. CÆSIA, Ait. *Blue-stemmed Golden-rod.*

Smooth; *stem* terete, erect; *leaves* lanceolate or oblong-lanceolate, serrate, pointed, sessile; *heads* in short axillary clusters or racemes; *rays* 5 to 7.

Moist rich woodlands; common. Aug. *Stem* 2 to 3 feet high, slender, usually dark purple and glaucous, simple or branched. *Leaves* 2 to 5 inches long, long-pointed, sessile, glaucous beneath. *Heads* middle-sized, in numerous axillary racemes. *Flowers* deep yellow.

5. S. LATIFOLIA, L. *Broad-leaved Golden-rod.*

Nearly smooth; *stem* angled, mostly flexuous, smooth; *leaves* broad, ovate or oval, long pointed at each end, coarsely dentate-serrate; *heads* in very short axillary clusters or racemes.

Moist woods and shaded banks; common. Aug.—Oct. *Stem* 1 to 3 feet high, slender, mostly smooth. *Leaves* 3 to 5 inches long, 2 to 4 wide, with acute and often long serratures. *Clusters of heads* short, the stem terminating with a long terminal one. *Rays* 3 to 4. *Disk-flowers* 6 to 7.

6. S. bicolor, L. *White-rayed Golden-rod.*

Hairy; *stem* simple; *leaves* oblong or elliptical-lanceolate, acute at each end; *lower ones* serrate, short-stalked; *racemes* short, dense, leafy, erect; *scales of the involucre* obtuse.

Woods and dry hills; common. Aug.—Oct. *Stem* 1 to 2 feet high, erect. *Lower leaves* tapering into a petiole. *Clusters* or *short racemes* from the axils of the upper leaves, forming an interrupted spike or crowded panicle. *Rays* about 8, small, cream-color or nearly white. Var. *concolor*, Torr. & Gray. *Flowers* all yellow.

**** *Heads in erect, terminal, simple or compound racemes.*

7. S. puberula, Nutt. *Puberulent Golden-rod.*

Minutely puberulent; *stem-leaves* lanceolate, acute, tapering to the base; *lower leaves* wedge-lanceolate, subserrate; *heads* very numerous, crowded in compact erect-spreading short racemes; *scales of the involucre* linear-awl-shaped, appressed; *rays* about 10, elongated.

Low woods in sandy soil. Aug.—Oct. *Stem* straight, purplish, 1 to 3 feet high. *Leaves* very minutely pubescent, 2 to 3 inches long; the lower ones on dense winged stalks. *Heads* rather large, bright yellow, in a prolonged and dense narrow or pyramidal panicle.

8. S. stricta, Ait. *Upright Golden-rod.*

Smooth throughout; *Stem* simple, strict; *leaves* lanceolate, pointed, the lower ones tapering gradually into winged petioles, somewhat sheathing at the base, minutely serrate above the appressed teeth; *racemes* much crowded and appressed in a dense wand-like panicle; *scales of the involucre* linear-oblong, obtuse; *rays* 5 to 6, small.

Wet woods. July, Aug. *Stem* 2 to 3 feet high, very smooth. *Root leaves* 6 to 10 inches long, ¾ to 1 inch wide. *Panicle* terminal, close, compound, of short, dense, appressed racemes. *Heads* 12 to 18 flowered.

9. S. speciosa, Nutt. *Showy Golden-rod.*

Stem smooth, simple; *leaves* oval or ovate, slightly serrate, the uppermost oblong-lanceolate, the lower ones contracted into a margined petiole; *heads* somewhat crowded in numerous erect racemes; *peduncles* and *petioles* rough-hairy; *involucre* cylindrical with oblong, obtuse scales.

Woods; rather common. Aug.—Oct. A very handsome species, sometimes 6 feet high. *Leaves* thickish, 4 to 6 inches long and 2 to 4 wide in the larger forms. *Heads* very numerous with conspicuous, rays of a rich yellow, in a large showy pyramidal panicle. *Rays* about 5, large.

***** *Heads in one-sided racemes; leaves triple-veined.*

10. S. nemoralis, L. *Grey Golden-rod. Field Aster.*

Minutely greyish, hoary, pubescent; *stem* simple or corymbed at the summit *leaves* oblanceolate or spatulate-oblong, the lower somewhat crenate-dentate and tapering into a petiole; *heads* in numerous paniculate-secund racemes; *scales of the involucre* linear oblong, appressed; *rays* 6 to 9.

Dry, sterile fields; very common. Sept. A common starved looking species, 1 to 2 feet high, with a greyish, dusty aspect. *Heads* small but with conspicuous yellow rays. *Racemes* numerous, dense, at length recurved, forming a crowded compound panicle, which is usually turned to one side.

11. S. Canadensis, L. *Canadian Golden-rod.*

Stem tall and stout, rough, hairy; *leaves* lanceolate, pointed, sharply serrate, more or less pubescent beneath; *heads* small; *racemes* paniculate, one-sided, recurved; *rays* very short.

Borders of thickets and fields; very common. Aug., Sept. *Stem* 2 to 5 feet high, furrowed. *Leaves* sessile, 3 inches long, sometimes nearly entire, rough on the upper side. *Heads* very numerous, small, with very obscure yellow rays.—Varies greatly in the roughness and hairiness of the stem and leaves, the latter varying to oblong-lanceolate or elongated linear-lanceolate.

12. S. SEROTINA, Ait. *Late-flowering Golden-rod.*

Stem very smooth, tall and stout, often glaucous; *leaves* lanceolate, pointed, serrate, roughish, slender, pubescent; *rays* numerous, short.

Thickets and low grounds; common. Sept., Oct. *Stem* 4 to 8 feet high, terete, sometimes purplish. *Leaves* 3 to 7 inches long, ⅙ as wide, lower ones slightly toothed, upper ones entire. *Heads* numerous, middle-sized, forming a more or less compact panicle inclined at the summit.

13. S. GIGANTEA, Ait. *Gigantic Golden-rod.*

Stem smooth, stout and tall; *leaves* lanceolate, acuminate, very sharply serrate, smooth on both sides, margin rough, ciliate; *heads* in paniculate racemes; *branches* pubescent; *peduncles* and *pedicels* hairy; *rays* rather long.

Fields and fence rows; common. Aug.—Oct. *Stem* 4 to 7 feet high, green sometimes purplish, sometimes much branched above. *Leaves* 2 to 7 inches long, ⅙ as wide, acuminate at each end. *Heads* larger than in the two preceding species. *Panicle* diffuse on spreading, leafy branches.

****** *Heads in one-sided racemes; leaves feather-veined, all entire.*

14. S. SEMPERVIRENS, L. *Evergreen or Salt Marsh G.-rod.*

Smooth; *stem* stout; *leaves* fleshy, lanceolate, closely sessile or somewhat clasping; the *radical leaves* oval or lanceolate-oblong, obscurely triple-nerved; *heads* in erect racemose panicles; *rays* 8 to 10, elongated.

Salt marshes and river banks near the water. Sept. *Stem* 2 to 8 feet high, purplish, somewhat glaucous, with numerous long and narrow leaves. *Heads* showy, with golden yellow rays.

15. S. ODORA, *Sweet-scented Golden-rod.*

Smooth; *radical* and *lower stem-leaves* elliptical or lance-oval; *leaves* linear-lanceolate, entire, smooth, pellucid-dotted, scabrous on the margin; *racemes* paniculate one-sided.

Borders of thickets, sunny hills and fertile woodland. July—Sept. *Stem* 2 to 3 feet high, yellowish green, with lines of pubescence from the base of the leaves. *Leaves* 2 to 3 inches long, ¼ to ½ wide. *Heads* middle-sized, in one-sided racemes, forming a terminal pyramidal panicle. *Rays* 2 to 4, oblong, large. The leaves and flowers when dried form an excellent substitute for tea. The leaves are aromatic, and yield by distillation a fragrant volatile oil.

******* *Heads in one-sided racemes; leaves feather-veined, the lower ones toothed.*

16. S. PATULA, Muhl. *Spreading Golden-rod.*

Stem smooth, strongly angled; *leaves* ovate, acute, serrate, very smooth and veiny. underneath, upper surface very rough; *racemes* paniculate, spreading.

Swamps; common. Aug., Sept. *Stem* 2 to 5 feet high, often purple, branched above. *Leaves* often 6 to 8 inches long, lead-colored; the lower ones oblong-spatulate, the upper surface remarkably rough. *Heads* rather large on numerous racemes, on the spreading branches. *Rays* 6 to 7, oblong.

17. S. NEGLECTA, Torr. & Gray. *Neglected Golden-rod.*

Smooth; *stem* stout; *leaves* thickish, varying from narrow-lanceolate to ovate-lanceolate, tapering to both ends, feather-veined, entire, the lower ones serrate; *racemes* dense, one-sided, at length spreading, on elongated, slender, sub-erect branches.

Swamps. Aug., Sept. *Stem* 2 to 3 feet high, straight, round, dividing at top into several nearly erect branches. *Lower leaves* 5 to 7 inches long. *Heads* middle-sized, 10 to 20 flowered. *Racemes* at first erect and scarcely one-sided.

18. S. ARGUTA, Ait. *Sharp-toothed Golden-rod.*

Smooth; *radical* and *lower stem-leaves* eliptical or lance-oval, sharply serrate, with spreading teeth, obscurely 3-nerved, pointed, tapering into winged and ciliate petioles; *upper leaves* lanceolate or oblong, tapering to each end, mostly entire; *racemes* dense, at length elongated and recurved, forming a crowded and flat corymb-like panicle; *rays* 8 to 12, small.

Woods and banks; common. Aug., Sept. *Stem* 2 to 4 feet high, round, sometimes purple. *Heads* small, very numerous. *Scales of the involucre* closely appressed.—Well distinguished by its long or drooping racemes. S. *juncea* of Ait. is a variety with narrow leaves and less dense panicles.

19. S. Muhlenbergii, T. & G. *Muhlenberg's Golden-rod.*

Smooth; *stem* angled; *radical leaves* ovate, on margined petioles; *stem leaves* elliptical-lanceolate, very sharply and strongly serrate, pointed at both ends; *racemes* one-sided, spreading, disposed in an elongated open panicle.

Low grounds. Aug.—Oct. *Stem* 2 to 3 feet high, mostly simple, bearing a long open panicle. *Leaves* large and thin, notched with very acute teeth, feather-veined. *Heads* middle-sized, with 6 to 7 large spatulate-oblong rays.

20. S. altissima, L. *Tall Rough Golden-rod.*

Rough, hairy; *stem* erect, hisped, with rough hairs; *leaves* ovate-lanceolate, elliptical or oblong, acute or pointed, coarsely serrate, rough and wrinkled; *racemes* paniculate, spreading or recurved; *rays* 6 to 9.

Borders of fields and woods; very common. Aug., Sept. *Stem* 2 to 7 feet high, much branched at top. *Leaves* numerous on the stem and branches, variously toothed or serrate. *Branches* widely spreading, each terminating in a recurved panicle with the flowers turning upwards. A very variable species.

21. S. ulmifolia, Muhl. *Elm-leaved Golden-rod.*

Stem smooth, the branches hairy; *leaves* thin, elliptical-ovate or oblong-lanceolate, pointed, tapering to the base, coarsely serrate; *racemes* panicled, recurved-spreading; *involucre scales* lanceolate-oblong; *rays* about 4.

Low grounds; common. Aug., Sept. *Stem* about 3 feet high, rarely with scattered hairs. *Root-leaves* tapering to winged petioles. *Heads* in racemes which are often slender and usually recurved. *Rays* deep-yellow. Distinguished from the last by its smooth stem and the larger leaves.

18. CHRYSOPSIS, Nutt. Golden Aster.

Gr. *chrusos*, gold, and *opsis*, aspect, in allusion to the golden blossoms.

Heads many-flowered. Ray-flowers numerous, ligulate, pistillate; those of the *disk* tubular, perfect. Involucre imbricate, with linear scales destitute of herbaceous tips. Receptacle flat. Achenia obovate, flattened, hairy. Pappus double, the exterior short, interior copious, capillary.—*Perennial hairy herbs, with alternate entire leaves, rather large, often corymbose heads of golden yellow flowers terminating the branches.*

1. C. Mariana, Nutt. *Maryland Chrysopsis.*

Clothed with long somewhat silky hairs; *leaves* oblong or elliptical, veiny, nearly entire, the upper closely sessile, the lower spatulate and generally obtuse; *corymb* nearly simple.

Sandy soil. Aug. *Stem* 1 to 3 feet high, mostly simple, leafy, and with the leaves clothed with scattered long, silky hairs. *Heads* rather few, large, 12 to 20 rayed, in a terminal somewhat umbellate corymb. *Peduncles* viscid, glandular.

SECTION 3. *Heads radiate; rays yellow; anthers with tails at the base; receptacle naked.*

19. INULA, Linn. ELECAMPANE.

The ancient Latin name.

HEADS many-flowered. RAY-FLOWERS in a single series, pistillate, ligulate, rarely tubular; DISK-FLOWERS perfect, tubular. INVOLUCRE imbricated. PAPPUS of capillary bristles. RECEPTACLE flat, or somewhat convex, naked. HEADS solitary or corymbose.—*Coarse European perennial herbs with alternate leaves, and large heads of yellow flowers.*

HELENIUM, L. *Common Elecampane.*

Stout; *root-leaves* ovate, tapering into a petiole; *stem-leaves* somewhat clasping, all of them acute, toothed, woolly underneath; outer *involucre scales* leaf-like; *rays* narrow, very numerous; *achenia* prismatic, 4-sided.

A large coarse-looking plant, naturalized by road-sides. Native of Europe. Aug. *Stem* 4 to 6 feet high, furrowed, branching and downy above. *Radical-leaves* 1 to 3 feet long, 6 to 12 inches wide. *Flowers* large, solitary, terminal, bright yellow. *Rays* linear, with 2 or 3 teeth at the end. The root is mucilaginous, and is highly esteemed as a domestic medicine.

20. ECLIPTA, Linn.

Gr. *ekleipa*, to be *deficient*, alluding to the absence of *pappus*.

HEADS many-flowered. RAY-FLOWERS pistillate, in one series, ligulate, very narrow and short; DISK-FLOWERS perfect, tubular, 4-toothed. INVOLUCRE in 2 series; the *scales* 10 to 12, leaf-like, ovate-lanceolate. RECEPTACLE flat, furnished with linear thread-like chaff. ACHENIA short, 3 to 4 sided, in the disk 2 sided, sometimes hairy at the summit. PAPPUS none, or an obscure toothed crown.—*Annual or biennial rough herbs, with slender stems, opposite lanceolate or oblong leaves, and whitish flowers, axillary, or solitary and terminal; anthers brown.*

E. PROCUMBENS, Michx. *Procumbent Eclipta.*

Rough with close appressed hairs; *stem* procumbent, creeping or ascending; *leaves* oblong lanceolate, acute at each end, sessile, slightly serrate; *peduncles* axillary or terminal longer than the head. Annual.

Damp sandy soils, western parts of the State. June—Oct. *Stem* 1 to 3 feet long, often rooting at the base. *Leaves* ½ to 1 inch by ¼ to ½, rough, obscurely triple-veined. *Heads* small, with minute flowers and short rays on peduncles many times longer than the head.—Var. BRACHYPODA has the peduncles scarcely longer than the head.

SECTION 3.—*Heads discoid.*

21. PLUCHIA, Cass. MARSH FLEABANE.

Named in honor of *N. Pluche*, a French botanist.

HEADS many-flowered; the flowers all tubular; the central ones perfect or sterile, few, with a five-cleft corolla; the outer inmany series, with thread-shaped truncate corollas, pistillate and fertile. INVOLUCRE imbricated. RECEPTACLE flat, naked. ACHENIA grooved. PAPPUS capillary in a single row. —*Herbs somewhat glandular, emitting a strong camphoric smell, with alternate entire leaves and corymbs of purple flowers.*

P. FŒTIDA, DC. *Fœtid Marsh Fleabane.*

Nearly smooth; *stem* erect, very leafy; *leaves* broadly lanceolate, acute at each end, distinctly petioled, veiny, obtusely serrate; *heads* numerous, in paniculate corymbs.

Open, hilly grounds and river banks, western parts of the State. Aug. Per. *Stem* 2 to 4 feet high, sub-simple. *Leaves* 4 to 7 inches long, 1½ to 3 wide, sprinkled with minute dots, on petioles ½ to 1 inch long.

TRIBE IV. SENICIONIDEÆ. THE GROUNDSEL TRIBE.

Heads radiate or discoid; branches of the style linear, hairy or hisped at the apex, which is either truncated or produced into a conical or elongated appendage; leaves opposite or alternate.

SECTION 1.—*Heads radiate; flowers yellowish or greenish.*

22. POLYMNIA, Linn.

Dedicated to one of the ancient Muses, for no imaginable reason.

HEADS many-flowered. RAY-FLOWERS pistillate, ligulate, in one series; DISK-FLOWERS perfect, tubular, sterile. RECEPTACLE flat, chaffy. INVOLUCRE double; the outer scales about 5, leaf-like, large and spreading, the inner small and membranaceous, surrounding the round obovoid achenia. PAPPUS none.—*Tall, branching, viscid and hairy perennial herbs, with large opposite leaves, the upper lobed with dilated appendages at the base, and light yellow heads of flowers in panicled corymbs.*

1. P. CANADENSIS, L. *Leaf-cup.*

Clammy, hairy; *lower leaves* deeply pinnatifid, or lyrate; the *uppermost* triangular-obovate or wedge-form, shorter than the involucre.

Moist, shaded ravines. June, July. *Stem* 2 to 5 feet high, roughly pubescent and somewhat viscid, branching. *Leaves* opposite or alternate, very thin, mostly 3 to 5 lobed at the apex. *Flowers* light yellow, with short rays, surrounded by the concave leaflets of the double involucre, so as to form a sort of a cup, hence called *leaf-cup*. *Heads* ½ inch in diameter.

2. P. UVEDALIA, L. *Large Leaf-cup.*

Roughish, hairy, stout; *leaves* broadly ovate, angled and toothed, nearly sessile, the lower palmately lobed, abruptly narrowed into a winged petiole; outer *scales of the involucre* very large; *rays* 10 to 15.

Rich soils. July, Aug. *Stem* 3 to 6 feet high, round. *Lower leaves* very large.

Heads of flowers large, few, arranged in loose panicles, the *rays* much longer than the involucre, bright yellow; *disk* dull yellow.

23. SILPHIUM, Linn. ROSIN-PLANT.

Gr. *silphion*, the ancient name of a medicinal plant of Africa, transfered to the genus by Linnæus.

HEADS many-flowered. RAY-FLOWERS numerous, ligulate, pistillate and fertile, their broad flat ovaries imbricated in 2 to 3 rows; DISK-FLOWERS perfect but sterile, tube short. RECEPTACLE somewhat convex, chaffy. INVOLUCRE bell-shaped, with imbricated scales in several rows, the outer with loose leaf-like summits. ACHENIA broad and flattened, surrounded by a ring which is notched at the top, destitute of pappus, or with 2 teeth confluent with the winged margin; those of the disk abortive, with an obsolete crown-like pappus.—*Coarse and tall rough perennial herbs, with a copious resinous juice, and large heads of yellow flowers in corymbose panicles.*

* *Stem round or slightly 4-angled, leafy: leaves undivided.*

1. S. TRIFOLIATUM, L. *Three-leaved Rosin Plant.*

Stem tall and rather slender, smooth, often glaucous; *stem leaves* lanceolate, pointed, entire or scarcely serrate, rough, on very short petioles, in whorls of 3 or 4; *upper leaves* opposite; *heads* loosely panicled; *involucre* smooth; *scales* broadly ovate, rather obtuse; *achenia* broadly oval, sharply 2-toothed at the top.

Dry woods and plains. Aug. *Stem* 5 to 6 feet high, slightly angled, purplish. *Leaves* thick, 3 to 5 inches long. *Heads* loosely cymose on rather long peduncles. *Rays* 12 to 16, expanding about 2½ inches, bright yellow.

** *Stem square; leaves opposite, connate.*

2. S. PERFOLIATUM, L. *Cup Plant.*

Stem stout, square; *leaves* ovate, coarsely toothed, connate-perfoliate, narrowed towards the base; *heads* in a trichotomous cyme, the central on a long peduncle.

Rich soil along streams. Aug. *Stem* 4 to 6 feet high, often branched above. *Leaves* 6 to 16 inches long, the upper united by their bases and forming a cup-shaped disk, the lower narrowed into winged petioles, which are connate by their bases. *Heads* large, with 15 to 25 yellow rays. *Achenia* winged and variously notched.

24. AMBROSIA, Tourn. RAG-WEED.

Gr. *ambrosia, the food of the gods*, a term strangely applied.

HEADS monœcious; the fertile at the base and the sterile at the top of the spike. STERILE INVOLUCRE flattish or top-shaped, composed of 7 to 12 scales united into a cup, containing 5 to 20 funnel-form staminate flowers. FERTILE INVOLUCRE oblong or top-shaped, closed, pointed, and usually with 4 to 8 horns near the top in one row inclosing a single pistillate flower. ACHENIA ovoid.—*Herbaceous chief-*

ly annual coarse weeds, with opposite or alternate lobed or dissected leaves, and inconspicuous greenish or whitish flowers.

1. A. TRIFIDA, L. *Great Rag-weed.*

Stem tall and stout; *leaves* 3-lobed serrate, the lobes oval-lanceolate, acuminate; *racemes* panicled; *fruit* 6-ribbed, the ribs terminating in as many crested tubercles Var.—INTEGRIFOLIA has all the *leaves*, or the upper ones, undivided, ovate or oval, pointed.

Low moist grounds, and banks of streams; common. Aug. *Stem* 4 to 12 feet high, square, rough and hairy as well as the large leaves. *Leaves* 4 to 7 inches broad, opposite. *Flowers* obscure and unattractive, in long leafless spikes, axillary and terminal.

2. A. ARTEMISÆFOLIA, L. *Roman Wormwood. Hog-weed. Common Rag-weed.*

Stem slender, much branched hairy or roughish-pubescent; *leaves* opposite, and the upper alternate, twice pinnatifid, smoothish above, paler or hoary beneath; *racemes* or *spikes* loosely panicled; *fruit* obovoid globular, pointed, armed with about 6 short teeth.—Var. HETEROPHYLLA, has the stem leaves pinnatifid, those of the branches lanceolate.

Waste places; common everywhere. July—Sept. An extremely variable weed, 1 to 3 feet high, with finely cut leaves, embracing several nominal species.

25. XANTHIUM, Tourn. COCKLE-BURR.

Gr. *xanthus*, yellow; in allusion to the color the plants are said to yield.

FERTILE and STERILE FLOWERS occupying different heads on the same plant; the fertile clustered below; the sterile in short spikes or racemes above. FERTILE INVOLUCRE closed, coriacious, ovoid or oblong, clothed with hooked prickles, so as to form a rough burr, 2-celled, 2-flowered, the flowers pistillate, with a slender filiform corolla. STERILE INVOLUCRE sub-globose, many-flowered, with the scales in one series. ACHENIA oblong, flat.—*Low coarse annuals, with stout branching stems and alternate lobed or toothed petioled leaves.*

1. X. STRUMARIUM, L. *Common Cockle-burr. Clot-weed.*

Stem unarmed, branching; *leaves* cordate, lobed, 3-veined, unequally serrate, rough; *fertile involucre* oval, somewhat pubescent, the beaks straight.

Roadsides and waste places; introduced. July—Sept. *Stem* bristly, spotted, 2 to 3 feet high. *Leaves* large, 3 to 6 inches broad, on long stalks, rigid. *Fertile flowers* in sessile axillary tufts. *Sterile flowers* few together, terminal, globular, green. *Fruit* a hard 2-celled burr, near an inch long, covered with stiff hooked prickles.

2. X. SPINOSUM, L. *Thorn Clot-burr.*

Leaves ovate-lanceolate, pointed, wedge-shaped at the base, entire or slightly 3-lobed, minutely pubescent above, hoary underneath.

Waste places; introduced. Sept.—Nov. *Stem* 1 to 3 feet high, armed with 3-parted slender spurs. *Leaves* entire or repand-denticulate. *Heads* few, axillary, solitary; *fertile* in the lower and *sterile* in the upper axils.

TRIBE V. HELIANTHEÆ. THE SUN-FLOWER TRIBE.

Heads radiate or rarely discoid; the disk-flowers always perfect and fertile; receptacle chaffy; anthers blackish, without tails at the base; pappus none, or crown-like, or of one or two chaffy awns, never capillary or of uniform chaffy scales; leaves chiefly opposite.

26. HELIOPSIS, Pers. Ox-eye.

Gr. *helios*, the *sun*, and *opsis*, *appearance*, from the resemblance of the flowers.

HEADS many-flowered; the RAY-FLOWER 10 or more in one series, ligulate, fertile; DISK-FLOWERS tubular, perfect. INVOLUCRE in 2 or 3 rows; the outer leaf-like and somewhat spreading; the inner shorter than the disk. RECEPTACLE conical; CHAFF linear. ACHENIA smooth, 4-angled. PAPPUS none, or a mere border.—*Perennial herbs, with opposite petioled leaves, and large showy heads of flowers with conspicuous yellow rays.*

H. LÆVIS, Pers. *Common Ox-eye.*

Nearly smooth; *leaves* oval-lanceolate or oblong-ovate, coarsely serrate, petiolate, 3-veined.

A large showy plant in hedges and thickets; common. July, Aug. *Stem* 2 to 6 feet high, angular, 2 or 3 times forked above. *Leaves* 2 to 6 inches long, 1 to 4 wide. *Branches* thickened at the summit, each terminating with a large, solitary, yellow head.—Var. SCABRA, has roughish foliage, and the involucre somewhat hoary, 6 feet high. Var. GRACILES is small and slender, with ovate-lanceolate leaves, acute at the base, 2 feet high.

27. RUDBECKIA.

In honor of *Olaus Rudbeck*, Professor of Botany at Upsal, in Sweden.

HEADS many-flowered; RAY-FLOWERS neutral, in a single series, ligulate; DISK-FLOWERS tubular, perfect. SCALES OF THE INVOLUCRE leaf-like, in about 2 rows, spreading. RECEPTACLE conical or columner, with short concave chaff. ACHENIA 4-angular, smooth, not margined, flat topped. PAPPUS none, or a minute crown-like border.—*Chiefly perennial herbs, with alternate leaves and showy large heads of flowers terminating the stem branches, with long and drooping yellow rays.*

* *Disk pale green or purplish.*

1. R. LACINIATA, L. *Tall Cone-flower.*

Stem smooth, branching; *leaves* smooth or roughish, the lower pinnate, with 5 to 7 cut or 3-lobed leaflets; *upper leaves* irregularly, 3 to 5-parted; the *lobes* ovate-lanceolate, pointed, or entire; *chaff* truncate and downy at the tip.

Low thickets; common. July—Sept. A tall, showy plant, 6 to 8 feet high. *Leaves* gradually less and less divided from the lowest to the uppermost ones. *Heads* rather large, terminal. *Rays* linear, 1 to 2 inches long, bright yellow, spreading or drooping. *Disk* greenish yellow.

* *Disk broadly conical, dark purple or brown.*

2. R. TRILOBA, L. *Three-lobed Cone-flower.*

Hairy; *stem* much branched, the branches slender and spreading; *upper leaves* ovate-lanceolate, somewhat clasping, serrate or entire; *lower leaves* 3-lobed, tapering at the base, coarsely serrate; *scales of the involucre* linear.

Dry soil. July—Sept. *Stem* 2 to 5 feet high, very branching. *Leaves* 2 to 4 inches long, 3-veined. *Heads* small, numerous and showy. *Rays* about 8, deep yellow, ½ to 1 inch long, ⅔ as wide.

3. R. SPECIOSA, Wender. *Showy Cone-flower.*

Roughish-hairy, branched; *leaves* lanceolate or ovate-lanceolate, pointed at both ends, petioled, 3 to 5-nerved, coarsely and unequally toothed or cut; *involucre* much shorter than the numerous elongated rays; *chaff of the disk* acutish, smooth.

Dry soil. Aug.—Oct. *Stem* 1 to 2 feet high, branched, the branches upright, elongated and naked above, terminated by single large heads. *Leaves* rather thin, those of the root 4 to 5 inches long by 3 to 4 wide, on petioles, 6 to 10 inches long. *Rays* about 18, oblong-linear, bright yellow.

4. R. FULGIDA, Ait. *Small-flowered Rudbeckia.*

Hairy; *stem* with slender branches; *leaves* spatulate-oblong or lanceolate, partly clasping, 3-nerved, the upper entire, mostly obtuse; *scales* oblong, spreading, as long as the spreading rays; *chaff* linear-oblong, obtuse.

Dry soil. July—Oct. *Stem* 1 to 3 feet high, branching, the upright branches naked at the summit and bearing single heads. *Rays* 12 to 14, scarcely longer than the leafy involucre, deep orange-yellow, 2-cleft at the summit. *Disk* nearly hemispherical, purple.

5. R. HIRTA, L. *Hairy Rudbeckia.*

Very rough and bristly-hairy; *stem* simple or branched near the base; *leaves* nearly entire; the *upper* oblong or lanceolate, sessile; the *lower* spatulate, 3-nerved, on petioles; *scales* nearly equalling the rays; *chaff* hairy at the tip.

Dry soil. July—Sept. A showy plant, 2 to 3 feet high, with the stem simple or branched near the base, naked above, bearing single large heads. *Rays* 12 to 15, bright yellow, 1 inch long, surrounding a broadly conical disk of dark purple or brown chaff and flowers.

28. LEPACHYS, Raf.

Gr. *lepis*, a scale, and *pakus*, thick, refering to the thickened tips of the chaff.

HEADS many-flowered; the RAYS few, neutral, in a single series; those of the DISK small, tubular, perfect. SCALES OF THE INVOLUCRE few, small, spreading. RECEPTACLE oblong or columner; the CHAFF truncate, thickened and bearded at the tip, partly embracing the flattened and margined achenia. PAPPUS none, or 2 teeth.—*Perennial herbs, with alternate pinnate leaves, and showy heads of yellow flowers, with long drooping rays; disk grayish.*

L. PINNATA, Torr. & Gray. *Tall Lepachys.*

Hairy with minute, appressed hairs; *leaves* pinnate; *leaflets* 3 to 7, lanceolate, acute at both ends, toothed or entire; *disk* oblong; *rays* much longer than the disk.

Dry soil. July—Sept. *Stem* 3 to 4 feet high, grooved, with naked branches above, terminated by single showy heads. *Rays* yellow, about 2 inches long, slightly toothed at the apex. *Disk* ovate, exhaling an anisate odor when bruised. *Achenia* of the ray 3-angled, hairy; that of the disk compressed, smooth or ciliate.

29. HELIANTHUS, Linn. SUNFLOWER.

Gr. *helios*, the *sun*, and *anthos*, a *flower*.

HEADS many-flowered; RAY-FLOWERS in one series, ligulate, neutral; those of the DISK, tubular, perfect. INVOL-

UCRE imbricated. RECEPTACLE flat or convex; the persistent chaff embracing the 4-sided and laterally achenia. PAPPUS very deciduous, consisting of two thin chaffy-awned scales (sometimes additional smaller ones).—*Coarse and stout herbs, mostly perennials, with mostly opposite leaves, generally triple-veined, and solitary or corymbed heads, with yellow rays.*

* *Disk flowers dark purple.*

1. H. ATRORUBENS, L. *Dark-red Sunflower.*

Stem erect, branched above, hispid with long scattered hairs: *leaves* mostly opposite, oblong-spatulate or ovate, slightly serrate, 3-nerved, scabrous; *involucre scales* lanceolate, acuminate, smooth, as long as the disk.

Gravelly soils. Aug., Sept. Per.—*Stem* 3 to 4 feet high. *Lower leaves* very large and often slightly cordate. *Heads* in a loose terminal panicle; *rays* about 16, yellow; *disk* dark purple.

2. H. ANNUUS, L. *Common Sunflower.*

Leaves cordate, 3-nerved, *lower* ones opposite; *peduncles* thick; flowers nodding. Native of South America. July, Aug. *Stem* 7 to 15 feet high. *Heads* of flowers very large, with broad rays of a brilliant yellow color. A splendid variety occurs with the flowers all radiate.

* * *Disk flowers yellow; leaves opposite, or the upper sometimes alternate.*

3. H. MOLLIS, Lam. *Downy Sunflower.*

Stem villous; *leaves* ovate with a somewhat cordate and clasping base, pointed nearly entire, hoary above; *involucre scales* lanceolate, downy.

Low grounds. July—Sept. Per.—*Stem* clothed with soft white hairs, simple, leafy, 2 to 4 feet high. *Leaves* hoary above, very soft white-hairy and reticulate underneath. *Heads* few, rather large; *rays* 15 to 25, about one inch long, yellow.

4. H. STRUMOSUS, L. *Pale-leaved Sunflower.*

Stem tall, rather simple; *leaves* ovate-lanceolate, long acuminate, serrate, 3-nerved, rough above, whitish and pubescent beneath, abruptly contracted into short margined petioles; *involucre scales* broadly lanceolate with spreading tips, equalling the disk.

River banks and dry woods; common. Aug., Sept. Per. *Stem* rough above, smooth below, 2 to 4 feet high, slender, simple or sparingly branched. *Heads* few, on roughly pubescent peduncles; *rays* about 10, bright yellow.

5. H. DIVARICATUS, L. *Cross-leaved Sunflower.*

Stem smooth, simple or forked at the top; *leaves* sessile ovate-lanceolate, rounded at the base, tapering to the point, opposite and divaricate, 3-nerved, serrate, thick with rough; *involucre scales* lanceolate, acuminate from a broad base, ciliate, spreading; equalling the disk.

Thickets and barrens; common. Aug., Oct. Per.—*Stem* 1 to 5 feet high, sometimes purple and glaucous, simple or forked and corymbed above. *Leaves* 3 to 5 inches long. *Heads* small, few, in a terminal panicle; *rays* 8 to 12, bright yellow; *disk* yellow.

6. H. TRACHELIFOLIUS, Willd. *Throatwort Sunflower.*

Stem tall, hairy, loosely branched above; *leaves* thin, ovate-lanceolate, or oblong-lanceolate, acuminate, serrate, 3-nerved, smoothish or roughish-pubescent on both sides, contracted into short petioles; *involucre scales* lance-linear, elongated and very acuminate, loose, outer ones larger and squarrose.

Dry swamps. Aug.—Oct. Per. *Stem* 3 to 6 feet high, purplish. *Leaves* 3 to 6 inches long, by ½ to 3 inches wide on petioles ½ to 1½ inches long. *Heads* middle sized, borne at the top of the slender suberect branches; *rays* expanding 2 to 3 inches long.

7. H. GIGANTEUS, L. *Tall Sunflower.*

Stem rough or hairy, branched above; *leaves* lanceolate, pointed, serrate, very rough above, rough-hairy beneath, narrowed and ciliate at the base, nearly sessile; *involucre scales* long, linear-lanceolate, pointed, hairy or strongly ciliate.

Thickets and swamps; common. Aug., Sept. Per.—*Stem* 3 to 10 feet high, paniculately branched at the summit, sometimes smoothish below. *Heads* numerous, in a loose terminal panicle; *rays* 12 to 20, pale yellow; disk greenish yellow.

8. H. DECAPETALUS, L. *Thin-leaved Sunflower.*

Stem erect, tall and branching, smooth below, rough above; *leaves* ovate-lanceolate, on short margined petioles, acuminate coarsely serrate, 3-nerved, thin and slightly scabrous; *involucre scales* lance-linear, elongated, loosely spreading, the outer longer than the disk.

Copses and low banks of streams; common. Aug.—Oct. Per.—*Stem* 3 to 5 feet high, slender, somewhat branching at the summit. Outer *involucral scales* sometimes foliaceous or changing to leaves. *Heads* in a fastigiate corymb; *rays* 8 to 10, narrow, pale yellow.

9. H. MICROCEPHALUS, Torr. & Gr. *Small-headed Sunflower.*

Stem smooth, with 4 to 6 slender branches above; *leaves* opposite, or the upper ones alternate, thin ovate-lanceolate, acuminate, somewhat serrate, veiny, petioled, rough above, downy or hairy underneath; *peduncles* slender, rough; *involucre scales* ovate and ovate-lanceolate, ciliate, the outer with squarrose tips.

Woods and thickets, western part of the State. *Stem* 3 to 8 feet high, usually in tufts. *Heads* small, oblong, ¼ to ½ inch broad; *rays* 5 to 6, nearly 1 inch long.

** *Leaves alternate, sometimes opposite below.*

10. H. MULTIFLORUS, L. *Many-rayed Sunflower.*

Stem erect, branching, scabrous; *leaves* alternate, petioled, toothed, 3-nerved lower cordate, upper ovate; *involucre scales* linear-lanceolate, ciliate, inner ones lanceolate.

Mountain woods. July—Sept. Per. *Stem* and *peduncles* rough hairy. *Leaves* sometimes opposite, rough, serrate. *Involucre* with 40 to 50 scales, imbricate, not squarrose. *Heads* erect; *rays* numerous, oblong. Perhaps introduced.

11. H. TUBEROSUS L. *Jerusalem Artichoke.*

Root bearing tubers; *Stem* stout and tall, branched, rough; *leaves* alternate, ovate, petiolate, 3-nerved, rough, serrate; *lower* cordate-ovate; petioles ciliate at base; *involucre scales* linear lanceolate.

Fields and cultivated grounds; naturalized, also cultivated. July—Sept. Per. *Stem* 4 to 8 feet high, branched. *Leaves* large wedge-shaped at base; *lower* ones opposite, rarely ternate or lobed. *Heads* rather large, terminal, on angular pubescent peduncles; *rays* 12 to 20, yellow. The root is sometimes used for pickling.

30. COREOPSIS, Linn. TICKSEED.

Gr. *koris*, a *bug*, and *opsis*, resemblance; from the form of the fruit.

HEADS many-flowered; *ray flowers* about 8, neutral, in a single series; *disk flowers*, small, tubular, perfect. INVOLUCRE double; each of about 8 scales, the outer somewhat foliaceous and spreading; the inner broader and appressed.—RECEPTACLE flat, with membraneceous chaff. ACHENIA flat, often winged, 2 toothed, 2 awned, or sometimes naked at the summit.—*Herbs with mostly opposite leaves, and yellow or parti-colored, rarely purple rays.*

* *Rays wanting.*

1. C. BIDENTOIDES, Nutt.

Dwarf, diffusely branched, smoothish; *leaves* lanceolate-linear, cut, toothed tapering into a petiole; *awns* slender, upwards barbed, much longer than the corolla, or the bristly young achenia.

Near Philadelphia, Nuttall.—Prof. Gray thinks this a very obscure and undoubtful plant.

** *Rays and disk yellow; leaves opposite, divided.*

2. C. TRICHOSPERMA, Michx. *Tickseed Sunflower.*

Smooth, branched; *leaves* short petioled; 5 to 7-divided; *leaflets* lanceolate or linear, cut-toothed or the *upper leaves* only 3 to 5 cleft and nearly sessile; outer *involucre scales* subspatulate, ciliate-serrate; *heads* in corymbose panicles.

Swamps, near the coast. Aug.—Oct. Biennial. *Stem* 2 to 3 feet high, obtusely 4-angled, much branched, smooth. Branches and leaves mostly opposite. *Leaves* thin, subsessile. *Leaflets* narrow tapering to a long point with a few unequal remote serratures. *Heads* large showy, yellow. *Achenia* narrowly wedge-oblong, bristly ciliate above, crowned with 2 triangular or awl-shaped stout teeth.

3. C. TRIPTERIS, Michx. *Three-leaved Tickseed.*

Smooth; *Stem* simple, tall, corymbose at summit; *leaves* 3 to 5-divided; *leaflets* lanceolate, acute, entire, scabrous on the margins; *heads* small on short peduncles.

Banks of streams. Aug.—Oct. Per. An elegant species, 4 to 6 feet high, slender, terete. Divisions of the leaves 3 to 5 inches long, by ¾ to 1½ inches wide. *Heads* rather small. in a loose terminal corymb, on short peduncles; *rays* about 8, spreading ½ inch long, yellow. The heads exhale the odor of anise when bruised.

CULTIVATED SPECIES.

*** *Rays or disk purple.*

4. C. TINCTORIA, Nutt. *Dyer's Coreopsis. Elegant Coreopsis.*

Leaves alternate, those of the root subpinnate; *leaflets* oval, entire, smooth; *stem leaves* subpinnate; *leaflets* linear; *achenia* naked. A handsome border annual, native of the Upper Missouri. *Stem* 1 to 3 feet high, with light smooth foliage. *Heads* with yellow rays, beautifully colored with brownish purple at their base. Flowering all summer. Partially naturalized in Union Co.

5. C. DRUMMONDII, T. & G. *Drummond's Coreopsis.*

Pubescent; leaves pinnately divided, sometimes simple, segments (or leaves) oval, entire; *involucre scales* lanceolate-acuminate; *rays* unequally 5 toothed, twice longer than the involucre; *achenia* obovate, incurved, scarcely toothed. A beautiful annual from Texas. *Stems* 10 to 20 inches high. *Rays* large, yellow, with a purple spot at the base.

B. atrosanguinea, a variety in cultivation, with dark orange flowers.

31. ZINNIA, Linn.

Dedicated to *John Godfrey Zinn*, a German botanist, 1557.

HEADS many-flowered; RAYS 5, persistent, entire, pistillate; DISK FLOWERS perfect. RECEPTACLE chaffy, conical. PAPPUS of the disk of 2 erect awns. INVOLUCRE SCALES oval, margined, imbricate. *Annuals, native at the South, common in cultivation, with opposite entire leaves and showy heads of flowers.*

1. Z. ELEGANS, L. *Elegant Zinnia.*

Stems hairy; *leaves* cordate, sessile-amplexicaul; *heads* on long peduncles; *chaff* serrated. July, Aug. Several varieties are known in cultivation with violet, white, purple, scarlet and yellowish flowers.

2. Z. MULTIFLORA, L. *Many-flowered Zinnia. Youth and old age.*

Leaves ovate-lanceolate on short petioles; *heads* on long peduncles with dull scarlet rays. Z. *pauciflorum,* with bright yellow flowers, is also found in cultivation.

32. TAGETES, Linn. MARIGOLD.

Named for *Tages,* a Tuscan divinity.

HEADS heterogamous; RAY-FLOWERS 5, persistent. INVOLUCRE simple, tubular, of 5 united scales. RECEPTACLE naked. PAPPUS of 5 erect awns.—*Annual herbs, natives of tropical America, with pinnately divided leaves and showy heads of flowers.*

1. T. PATULA, L. *French Marigold.*

Stem erect, with spreading branches; *segments of the leaves* linear-lanceolate; *peduncles* elongated, sub-cylindric, one-flowered; *involucre* smooth. Stem 1 to 2 feet high. *Flowers* yellow-orange, striped and variegated with deep brown.

2. T. ERECTA, L. *African Marigold.*

Leaves pinnately divided; *segments* lanceolate; cilliate-serrate; *peduncles* 1-flowered, ventricose and thickened at the summit; *involucre* angular. *Stem* 2 to 3 feet high, with large heads of deep yellow and orange colored flowers.

33. ACTINOMERIS, Nutt.

Gr. *aktin,* a ray, and *meris,* a part, alluding to the small number, or irregularity of the rays.

HEADS many-flowered; RAY-FLOWERS neutral, few, elongated or rarely wanting; DISK FLOWERS tubular, perfect. INVOLUCRE foliaceous, nearly equal, in 1 to 3 rows. RECEPTACLE convex, chaffy, the outer chaff embracing the outer margin of the flat, obovate, compressed and winged achenia. PAPPUS of 2 smooth persistent awns.—*Tall and branching perennial herbs, with serrate feather-viened leaves, and corymbed heads of chiefly yellow flowers.*

1. A. SQUARROSA, Nutt. *Tall Achtinomeris.*

Stem erect, somewhat hairy and winged above; *leaves* alternate, or the lower opposite, oblong or ovate-lanceolate, pointed at both ends; *heads* in an open corymbed.

panicle; *involucre scales* in 2 rows, the outer linear spatulate; *achenia* broadly winged.

Moist grounds; common. Aug., Sept.—*Stem* 4 to 8 feet high, slender, smooth below. *Heads* small, in a terminal leafy corymbose panicle; *rays* 4 to 10 irregular, oblanceolate, yellow; *disk* greenish-yellow. *Receptacle* globular.

34. BIDENS, Linn. BURR MARIGOLD.

Lat. *bidens*, having two teeth; in allusion to the two awns of the achenia.

HEADS many-flowered, the RAY-FLOWERS 3 to 8 neutral, often wanting; DISK-FLOWERS tubular, perfect. INVOLUCRE double, unequal, the outer series often large and leafy. RECEPTACLE flattish, chaffy, the chaff deciduous with the fruit. ACHENIA flattened, parallel with the scales of the involucre, or slender and 4-sided, crowned with 2 or more rigid and persistent awns which are downwardly barbed.—*Annual or perennial herbs, with opposite various leaves, and mostly yellow flowers.*

* *Rays inconspicuous or none.*

1. B. FRONDOSA, L. *Common Beggar-ticks.*

Smooth or somewhat hairy: *stem* tall and branching; *leaves* 3 to 5-divided, the *leaflets* lanceolate, pointed, coarsely toothed, mostly petioled; outer *leafy involucre* much longer than the head, ciliate below; *rays* none; *achenia* wedge-obovate, 2-awned, somewhat ciliate on the margin.

Moist waste places; common. July—Sept. A very troublesome weed 2 to 4 feet high, sending out many spreading branches. *Lower leaves* pinnate, *upper ones* ternate, lanceolate, serrate. *Flowers* in clusters at the ends of the branches, without rays, yellow, surrounded by a large and leafy involucre. *Achenia* 2-awned, and as in the other species, adhering by their retrorsely barbed awns to the dress, and to the fleece of animals.

2. B. CONNATA, Mühl. *Swamp Beggar-ticks.*

Smooth; *leaves* lanceolate, serrate, connate at the base; *lower ones* mostly trifid *scales of the outer involucre* longer than the head, mostly obtuse, scarcely ciliate: *rays* none; *achenia* narrowly wedge-form, 3-awned.

Wet grounds; common. Aug. Annual. *Stem* 1 to 2 feet high, smooth and 4 furrowed, with opposite branches. *Leaves* tapering into margined petioles which are slightly united at the base: the lower often divided; the *lateral divisions* united at the base and decurrent on the petiole. *Flowers* terminal, solitary, without rays, consisting only of the tubular yellow florets, surrounded by a leafy involucre.

3. B. CERNUA, L. *Nodding Burr-Marigold.*

Nearly smooth, low; *leaves* all undivided, lanceolate, unequally serrate, scarcely connate; *heads* discoid or radiate, nodding; *outer involucre* longer than the head *achenia* wedge-obovate, 4-awned, the margins downwardly barbed.

Swamps and ditches. Annual. Aug.—Oct. *Stem* 1 to 2 feet high, purplish, striate above, branched around the base. *Branches* opposite. *Leaves* opposite, slightly connate. *Flowers* yellowish-green, with or without rays. *Rays* when present, about 8, smaller than *B. chrysanthemoides,* the leaves irregularly toothed and the outer involucre more leaf-like.

4. B. BIPINNATA, L. *Spanish Needles.*

Smooth, branching; *leaves* petioled bipinnately parted, the segments lanceolate or oblong ovate, mostly wedge-shaped at the base; *heads* on slender peduncles, with

2 to 4 small rays; *outer involucre* of linear scales as long as the inner; *achenia* long and slender, 4-grooved and angled, nearly smooth, 3 to 4 awned.

Dry soil, waste places. Annual. July—Sept. *Stem* 2 to 4 feet high, branching, smooth, 4-angled. *Leaves* 1 to 2 pinnately parted. *Leaflets* ovate-lanceolate, nearly smooth. *Heads* of flowers on long peduncles, each with 3 to 4 (or none) obscure, obovate yellow rays.

* * *Rays conspicuous.*

5. B. CHRYSANTHEMOIDES, Michx. *Large-flowered Burr-Marigold.*

Smooth, erect or reclining at the base; *leaves* lanceolate, tapering at both ends, more or less connate, acute, serrate; *heads* erect or nodding, conspicuously radiate; *outer involucre* mostly shorter than the long rays; *achenia* wedge-shaped, with 2 to 4 awns.

Swamps and ditches; common. Annual. Aug., Sept. A low plant, with large yellow-rayed flowers. *Stem* 6 to 20 inches high. *Leaves* smooth, with few remote teeth. *Heads* rather large, solitary at the ends of the branches, erect or somewhat nodding; *rays* elliptic, 8 to 10, bright yellow, 1 inch long.

35. VERBESINA, Linn. CROWNBEARD.

"Name altered from *Verbena*."

HEADS few and many-flowered, mostly radiate; RAYS pistillate. SCALES of the erect involucre few, imbricated in 2 or more rows. RECEPTACLE flat or somewhat convex, the CHAFF concave and embracing the flowers. ACHENIA flat (compressed laterally), usually winged at the angles, crowned with 2 rigid awns.—*American perennial plants, with the toothed or lobed leaves decurrent on the stem, and solitary or corymbose heads of yellow flowers.*

1. V. SIEGESBECKIA, Michx. *Siegesbeck's Crownbeard.*

Stem smooth, 4-winged; *leaves* opposite, ovate, 3-nerved, serrate, pointed at both ends, smooth or pubescent underneath; *heads* in compound corymbs; *involucre scales* obtuse, few; *achenia* wingless.

Rich soil. Aug., Sept. *Stem* 4 to 6 feet high, erect, with 4 leafy wings. *Leaves* 5 to 8 inches wide, thin, tapering to a winged petiole. *Heads* in corymbs, yellow. *Rays* 1 to 5 lanceolate, 3 toothed, ¾ inch long.

2. V. VIRGINICA, *Virginian Crownbeard.*

Stem narrowly winged, downy pubescent above; *leaves* alternate, ovate-lanceolate, feather-veined, serrate, acute at each end, the lower decurrent; *heads* in compound corymbs, crowded; *rays* 3 to 4 oval; *achenia* narrowly winged.

Dry woods. Aug., Sept. *Stem* 3 to 6 feet high. *Heads* about 20-flowered, in crowded corymbs *Rays* very short, the tube (and involucre) pubescent, pale yellow, oval, scarcely ½ inch long.

SECTION 2.—*Pappus composed of several distinct chaffy scales.*

36. HELENIUM, Linn. FALSE SUNFLOWER.

Named after *Helen*, the wife of Menelaus.

HEADS many-flowered; radiate; the RAY-FLOWERS in a single series, pistillate, ligulate or rarely tubular, 3 to 5 cleft, DISK-FLOWERS perfect, tubular, very short 4 to 5 toothed. INVOLUCRE small, reflexed, the *scales* linear or awl-shaped. RECEPTACLE globose or oblong, naked. ACHENIA top-shaped, ribbed. PAPPUS of 5 to 8 thin and 1-nerved chaffy scales, each extended into a bristle or point.—*Erect branching herbs, with alternate leaves decurrent on the angled stem and branches, which are terminated by single or corymbed heads of yellow flowers.*

H. AUTUMNALE, L. *Sneeze-weed.*

Nearly smooth; *stem* erect, branched; *leaves* lanceolate, toothed, acute, decurrent; *disk* globose; *rays* 3 to 5 cleft, spreading or reflexed.

Alluvial soils, low grounds. Per. Aug.—Oct. *Stem* 2 to 3 feet high, winged by the decurrent leaves. *Leaves* narrowed at the base, the upper nearly entire. *Heads* showy middle-sized, in a terminal corymb; *rays* yellow, wedge-shaped; *disk* greenish-yellow. Whole plant intensely bitter.

SECTION 3. *Pappus none, or a very short crown. Heads radiate or discoid. Leaves alternate.*

37. MARUTA, Cass. MAY-WEED.

HEADS many-flowered; RAY-FLOWERS, ligulate, neutral; DISK-FLOWERS perfect. INVOLUCRE somewhat imbricated shorter than the disk. RECEPTACLE conical, more or less chaffy. ACHENIA obovoid, ribbed, smooth. PAPPUS none.—*Annual acrid herbs, with a strong odor, finely thrice pinnately divided leaves, and single heads with white rays and yellow disk terminating the branches.*

M. COTULA, DC. *Common May-weed.*

Smoothish; *leaves* 2 or 3 times pinnatifid, the segments subulate-linear *scales of the involucre* with whitish margins; *receptacle* conic.

Roadsides, common. Annual. June—Oct. *Stem* a foot high, erect, branched. *Leaves* pale green, more or less pilose; *segments* very narrow. *Heads* on elongated slender peduncles; *rays* about 12, white; *disk* convex, yellow. *Receptacle* chaffy only among the upper flowers. An exotic, every where naturalized.

38. ANTHEMIS, Linn. CHAMOMILE.

Gr. *Anthemis*, the ancient name, given in allusion to the profusion of the flowers.

HEADS many-flowered; RAY-FLOWERS in one series ligulate, pistillate; DISK-FLOWERS tubular perfect. INVOLUCRE SCALES imbricate in a few series. RECEPTACLE convex oblong or conic. ACHENIA terete, striate or smooth. PAPPUS none or a minute crown.—*Annual or perennial herbs, with aromatic or strong odor, 1 to 2 pinnately divided leaves, and the branches terminated by single heads, with white rays and yellow disk.*

1. A. ARVENSIS, L. *Corn Chamomile.*

Pubescent; *leaves* pinnately parted; *divisions* linear-lanceolate, toothed, very acute; branchlets leafless at the summit; *involucre scales* obtuse; *chaff* lanceolate, pointed; *achenia* crowned with a very short margin.

Fields and cultivated grounds. Introduced from Europe. June—Aug. Biennial. *Stem* 9 to 15 inches high, branched. *Leaves* grayish-pubescent. *Heads* large; *rays* broad, white, spreading; disk yellow, convex.

2. A. NOBILIS, L. *Garden Chamomile.*

Stem prostrate, branching from the base, woolly; *leaves* decompound-pinnatifid; *segments* linear-subulate; *chaff* with a thin membraneous margin, lanceolate, scarcely as long as the flowers. Per. Native of Europe. Cultivated in gardens for its tonic and anodyne properties. The agreeable scent of the chamomile is well known.

39. ACHILLEA, Linn. YARROW.

So named because its virtues are said to have been discovered by *Achilles.*

HEADS many-flowered; RAY-FLOWERS 4 to 6 pistillate, ligulate, short, or none; DISK-FLOWERS perfect, tubular 5-toothed. RECEPTACLE chaffy, flattish. ACHENIA oblong, flattened, margined. PAPPUS none.—*Perennial herbs, with much divided alternate leaves and small corymbose heads of whitish flowers.*

1. A. MILLEFOLIUM, L. *Common Yarrow. Milfoil.*

Stems mostly simple, erect, somewhat hairy; *leaves* twice-pinnately parted; the divisions linear, 3 to 5 cleft, crowded; *corymb* compound, flat-topped; *involucre* oblong; *receptacle* small.

Fields and hills; common. Aug. *Stem* 1 to 2 feet high, branched at the top. *Leaves* 2 to 6 inches long, cut into very numerous narrow segments. *Heads* numerous, in a dense terminal fastigiate corymb; *rays* 4 to 5, short, white or rose-colored.

40. LEUCANTHEMUM. Tourn. OX-EYE DAISY.

Gr. *leukos*, white, and *anthemon*, a flower.

HEADS many-flowered; RAY-FLOWERS numerous, fertile, or rarely neutral; DISK-FLOWERS perfect, with a fleshy somewhat 2-winged tube. INVOLUCRE broad and flat, imbricated; *scales* with scarious margins. RECEPTACLE naked, flat or convex. ACHENIA of the disk and ray similar, striate, destitute of pappus.—*Perennial herbs, with toothed or pinnatifid, alternate leaves and large single heads, with white rays and yellow disk terminating the branches.*

1. L. VULGARE, Lam. *Ox-eye. White Daisy. White-weed.*

Stem erect, nearly simple, naked above; *root-leaves* spatulate, petioled, toothed; *stem-leaves* somewhat clasping, cut or pinnatifid-toothed; *involucre scales* with a narrow rusty brown margin.

A pernicious weed, extensively naturalized in fields and meadows. June—Aug. *Stem* 1 to 2 feet high, erect or sub-decumbent at base, smoothish. *Leaves* comparatively few and small. *Heads* large, solitary on the branches, with 20 to 30 showy white rays, and numerous yellow disk flowers. (*Chrysanthemum Leucanthemum.* Linn.)

41. PYRETHRUM, Linn. Feverfew.

Involucre hemispherical, imbricate; scales with membraneous margins. Receptacle naked. Pappus a membraneous margin crowning the achenia.—*European herbs, chiefly perennials, with alternate leaves, and white flowers.*

P. parthenium, L. *Feverfew.*

Stem erect; *leaves* petiolate, flat tripinnate; *segments* ovate; *heads* on branching corymbose peduncles; *involucre* pubescent. Several varieties are common in cultivation, and are in great favor with many florists, on account of their pure white double flowers, borne on a pyramidal corymb.

42. CHRYSANTHEMUM, Linn.

Gr. *krusos,* gold, *anthos,* flower; many species bearing golden colored flowers.

Heads many-flowered; ray-flowers pistillate, ligulate 12 or more; disk-flowers perfect. Involucre imbricate, hemispherical; scales with membraneous margins. Receptacle naked. Pappus none.—*Annual and perennial, ornamental cultivated plants natives of China and other Eastern countries, with alternate lobed leaves and large showy heads of flowers.*

1. C. coronarium, L. *Showy Aster.*

Stem branched; *leaves* bipinnatifid, broader at the summit, acute. Annual. Native of S. Europe and N. Africa. Aug. *Stem* about 3 feet high, striate smooth, erect, with alternate clasping leaves. *Flowers* large, terminal, solitary, of a deep yellow color, double in cultivation.

2. C. carinatum, Willd. *Three-colored Chrysanthemum.*

Mostly smooth; *leaves* bipinnate, fleshy; *involucre* scales carinate. Native of Barbary. Annual. July—Oct. *Heads* large and beautiful; disk purple, *rays* white with a yellow base.

3. C. sinense, Sabine. *Chinese Chrysanthemum.*

Leaves coriaceous, petiolate, serrate-pinnatifid, dentate, glaucous; *rays* very numerous, long. Native of China, where it has long been cultivated and highly esteemed for its beauty. Numerous varieties have been produced, with double, semi-double and quilled flowers of every possible shade of color. Blooming in November, when all other flowers have disappeared, makes them desirable plants for every flower garden.

43. TANACETUM, Linn. Tanzy.

Said to be a corruption of *athanasia,* undying, from its durable flowers.

Heads many-flowered, nearly discoid, all fertile; the marginal flowers chiefly pistillate and 3 to 5 toothed, forming a kind of ray. INVOLUCRE hemispherical; SCALES imbricated, dry. RECEPTACLE convex, naked. ACHENIA angled or ribbed, with a large flat top. PAPPUS a short crown.—*Bitter and acrid strong-scented herbs, with alternate* 1 *to* 2 *pinnately dissected leaves and corymbed heads of yellow flowers.*

1. T. VULGARE, L. *Common Tanzy.*

Stem erect, smooth; *leaves* twice-pinnately parted, the leaflets and the margined petiole cut-toothed; *corymb* dense; *rays* terete; *pappus* 5-lobed.

Cultivated and naturalized, common. Aug. Per. *Stems* clustered 2 to 3 feet high, branched above into a handsome corymb of yellow flowers. Native of Europe.—Var. *crispum* has the leaves more cut and crisped.

44. ARTEMISIA, Linn. WORMWOOD.

Dedicated to the Goddess *Artemis*.

HEADS discoid, few to many-flowered; the flowers all tubular, those of the disk perfect; marginal ones pistillate, or sometimes all similar and perfect. INVOLUCRE ovoid; SCALES imbricated, with dry and scarious margins. RECEPTACLE small and flattish, naked. ACHENIA obovoid, with a small summit and no pappus.—*Bitter herbs or shrubby plants, with alternate leaves and small heads of yellow or purplish flowers in panicled spikes or racemes.*

* *Receptacle naked.* ABROTANUM, Tourn.

1. A. VULGARIS, L. *Common Mugwort.*

Branches and lower surface of the leaves whitish-woolly; *stem-leaves* pinnatifid; *segments* lanceolate, variously cut or entire; *heads* erect, ovoid, subsessile, in open leafy panicles.

Banks of streams, and waste places. Per. Sept., Oct. *Stem* 2 to 3 feet high, branching into a panicle of spicate racemes. *Leaves* very variable. *Heads* few, purplish. Introduced from Europe and naturalized.

2. A. ABROTANUM, L. *Southernwood.*

Stem erect; *lower leaves* bipinnate; *upper ones* capillary, pinnate; *involucre* hemispherical, downy. A well known shrubby plant, common in cultivation. *Stem* about 3 feet high. *Leaves* alternate much divided into linear segments. *Flowers* numerous, nodding, yellow. Native of South Europe.

** *Receptacle hairy. Flowers all fertile.* ABSINTHIUM, Tourn.

3. A. ABSINTHIUM, L. *Common Wormwood.*

Shrubby, erect, silky-canescent; *leaves* bipinnatifid; *segments* lanceolate, often incised, obtuse; *heads* hemispherical, in leafy paniculate racemes, nodding; *receptacle* hairy. Common in gardens. Aug. *Stem* 2 to 4 feet high, angular, several from one root. *Heads* numerous. *Flowers* yellowish. The whole plant is very bitter, and possessed of valuable medicinal properties as a tonic, stomachic, &c.

4. A. PONTICA, L. *Roman Wormwood.*

Stem-leaves bipinnate; *leaflets* linear, tomentose beneath; *heads* roundish, peduncled, nodding. Cultivated in gardens. *Stem* 3 to 4 feet high, with simple branches and racemes of yellow flowers. *Heads* about 24 flowered. From Austria.

45. GNAPHALIUM, Linn. CUDWEED.

Gr. *gnaphalon*, a lock of wool; in allusion to the floccose down of the leaves.

HEADS many-flowered; the flowers all tubular; the outer pistillate and very slender, the central perfect. INVOLUCRE ovate; SCALES imbricated in several rows. RECEPTACLE flat, naked. PAPPUS a single row of capillary rough bristles.—*Woolly herbs, with alternate sessile or decurrent entire leaves, and clustered or corymbed heads of whitish-yellow or purplish flowers.*

1. G. POLYCEPHELUM, Michx. *Fragrant Life-everlasting.*

Stem erect, woolly; *leaves* lanceolate, tapering to the base, with wavy margins, not decurrent, smoothish above, white tomentose beneath; *heads* obovate, clustered at the summit of the panicled-corymbose branches; *involucre scales* ovate and oblong.

Old fields and woods; common. Annual. July—Sept. *Stem* 1 to 2 feet high, often much branched at the summit. *Leaves* sessile, cottony beneath. *Flowers* in crowded clusters at the ends of the branches, yellowish-white. Whole plant fragrant.

2. G. ULIGONOSUM, L. *Low Cudweed. Low Life-everlasting.*

Stem simple, or branched, woolly all over; *leaves* lanceolate or linear; *heads* small in terminal sessile capitate clusters; *involucre scales* oblong, inner acute.

Wet grounds, roadsides; common every where. Annual. July—Sept. *Stem* 4 to 6 inches high, much branched. *Leaves* numerous, acute, narrow at the base; *involucre scales* yellowish-brown, shining. Whole plant clothed with whitish down.

3. G. PURPUREUM, L. *Purple Life-everlasting.*

Stem simple or branched from the base, ascending woolly; *leaves* oblong-spatulate, mostly obtuse, green above, very white with close wool underneath; *heads* in sessile clusters in the axils of the upper leaves, and spiked at the summit of the stem; *involucre scales* lance-oblong, tawny, the inner often marked with purple.

Gravelly soil, sandy fields and pastures; common. Annual. June.—*Stem* 8 12 inches high, sending out shoots at the base. *Heads* somewhat spiked at the top of the stem, with purplish scales and yellow corollas.

46. ANTENNARIA, Gært. EVERLASTING.

Name in allusion to the bristles of the pappus, which resemble *antennæ*.

HEADS many-flowered, diœcious or nearly so, corolla tubular; PISTILLATE FLOWERS filiform, 5-toothed. INVOLUCRE SCALES dry and scarious, white or colored, imbricated. RECEPTACLE convex or flat not chaffy. ACHENIA nearly terete. PAPPUS a single row of bristles, in the fertile flowers capillary, in the staminate club-shaped.—*Perennial white-*

woolly herbs, with entire alternate leaves, and corymbose heads with white scales and yellowish corollas.

1. A. MARGARITACEA, R. Brown. *Pearly Everlasting.*

Stem erect, tomentose; *leaves* linear lanceolate, acuminate, 1-nerved, sessile; *fertile heads* often with a few imperfect staminate flowers in the centre; *scales* of the pearly white involucre obtuse or rounded.

Dry hills and woods, common. Aug. *Stem* 1 to 2 feet high, and with the numerous scattered leaves clothed with white and cottony down, corymbose at the summit with many heads. *Heads* hemispherical, pedicellate. *Involucre* pearly white. *Flowers* yellow. Slightly fragrant.

2. A. PLANTAGINIFOLIA, Hook. *Plantain-leaved Everlasting.*

Stem simple, with procumbent shoots; *leaves* silky-woolly when young, at length green above and hoary beneath; *radical leaves* oval, petiolate, 3-nerved; *stem leaves* linear; *heads* in a small crowded corymb.

Wooded banks and sterile hills. April, May. *Stem* 3 to 8 inches high, often branched at the base into several from the same root. *Root leaves* much larger than those of the stem, ovate or oval-spatulate. *Stem leaves* few, bract-like. *Heads* clustered, terminal, purplish white. *Scales* of the mostly white involucre obtuse, in the sterile, and acutish and narrow in the fertile plant.

47. FILAGO. Tourn. COTTON ROSE.

Lat. filum, a thread; in allusion to the cottony hairs that cover these plants.

HEADS many-flowered, heterogamous; the terminal or *central flowers* numerous, pistillate, perfect or infertile, tubular, 4 to 5-toothed, the *outer flowers* filiform, pistillate, scarcely-toothed. INVOLUCRE SCALES few, woolly. RECEPTACLE elongated, filiform, naked at the summit, chaffy towards the margins or base. PAPPUS of the central flowers filiform, of the outer none or dissimilar.—*Low annual branching woolly herbs, with entire, alternate leaves and small heads of whitish or yellowish flowers in capitate clusters.*

F. GERMANICA, L. *Herba Impia. German Cud-weed.*

Stem erect, short, dichotomous or proliferously branched; *leaves* linear-lanceolate, acute, tomentose, crowded; *heads* woolly in capitate clusters, terminal and lateral; *scales* of the involucre awned.

Dry fields; introduced from Europe and sparingly naturalized. July—Aug.—*Stem* 4 to 8 inches high, woolly-tomentose, clothed with linear-lanceolate and upright crowded leaves, producing a capitate cluster of woolly heads, from which rise one or more branches, each terminated by a similar head, and continue in the same manner.

SUBTRIBE 6. SENICIONOIDEÆ.

Pappus soft and capillary. Anthers without tails at the base. Receptacle naked. Heads radiate or discoid. Leaves mostly alternate.

48 ERECHTHITES. Raf. FIRE-WEED.

An ancient name of some species of *senicio*.

HEADS many-flowered, discoid, the flowers all tubular and fertile; the marginal pistillate with a slender corolla. INVOLUCRE cylindrical; SCALES in a single row, linear, acute, with a few small bractlets at the base. ACHENIA oblong, striate. PAPPUS copious, of very fine and white soft hairs.—*Erect and coarse annuals, with alternate simple leaves, and paniculate corymbed heads of whitish flowers.*

E. HIERACIFOLIA, Raf. *Fire-weed. Whipsiwog.*

Stem grooved, simple or paniculate above; *leaves* oblong or lanceolate, acute, cut-toothed, sessile; upper auriculate at base and partly clasping. (Senecio hieracifolia, L.)

Moist woods, and especially recent clearings, where the ground has been burnt over, hence it is called *Fireweed;* common. July—Sept. *Stem* 2 to 5 feet high, stout, succulent, somewhat hairy, branching. *Leaves* light green, large, irregularly cut into many deep and acute teeth. *Flowers* terminal, crowded, destitute of rays, white. Whole plant emitting when bruised a rank odor. The distilled oil is probably one of the most powerful styptics the vegetable kingdom affords.

49. CACALIA, Linn. INDIAN PLANTAIN.

An ancient name, of uncertain meaning.

HEADS 5 to many-flowered, discoid; the flowers all tubular and perfect. INVOLUCRE SCALES in a single row, 5 to 30. COROLLA deeply 5-cleft. RECEPTACLE flat. ACHENIA oblong, smooth. PAPPUS of numerous capillary bristles.—*Smooth and tall perennial herbs, with alternate often petioled leaves, and rather large heads of mostly white or whitish flowers, in flat corymbs.*

* *Involucre 5-leaved and 5-flowered.*

1. C. RENIFORMIS, Muhl. *Great Indian Plantain.*

Stem grooved and angled; *leaves* petioled, smooth above, hairy on the veins below; *root leaves* broad-cordate, reniform, repand-toothed and angled, palmately veined; *stem-leaves* oblong, toothed, wedge-form and very entire at the base; *corymb* large.

Rich, damp woods. Aug., Sept. *Stem* 4 to 8 feet high, nearly simple, smooth. *Leaves* 3 to 12 inches long by 5 to 8 inches wide, repand-dentate; *lower petioles* very long. *Involucre* whitish. *Heads* white.

2. C. ATRIPLICIFOLIA, L. *Pale Indian Plantain.*

Stem erect, smooth, terete; *leaves* petioled, smooth, glaucous beneath; *lower leaves* deltoid-cordate, sinuate-angled, the *upper* rhomboid or wedge-form, toothed; *involucre* oblong.

Moist rich woods. Aug., Sept. *Stem* 3 to 5 feet high, leafy, round. *Lower leaves* 4 to 6 inches long, and nearly as wide, on long petioles, unequally toothed. *Heads* numerous, small, in a loose terminal corymb, greenish white.

** *Involucre 25 to 30-flowered; receptacle flat.*

3. C. SUAVOLENS, L. *Sweet-scented Cacalia.*

Stem grooved, erect, smooth; *leaves* triangular-lanceolate, halbert-shaped, pointed, serrate; those of the stem on winged petioles, smooth; *scales* about 13; *involucre* with several slender spreading bractlets.

Rich woods and banks of streams. Sept. *Stem* 3 to 4 feet high, grooved and angled, leafy. *Leaves* smooth and green on both sides. *Root-leaves* on long petioles, pointed. *Stem-leaves* on winged petioles. *Flowers* whitish, in a terminal compound corymb.

4. C. COCCINEA, Curt. *Scarlet Cacalia. Tassel Flower.*

Radical leaves ovate-spatulate; *stem-leaves* clasping, crenate; *involucre* ovate-cylindric; *scales* linear, at length reflexed; *achenia* ciliate; *pappus* in several rows A handsome border flower from the East Indies. *Stem* 1 foot high. *Flowers* bright scarlet. June—Sept. Annual.

50. SENECIO, Linn. GROUNDSEL.

Lat. *senex*, an *old man;* the pappus resembling a white beard.

HEADS many-flowered, discoid, with the flowers all perfect and tubular, or mostly radiate, the rays pistillate. INVOLUCRE SCALES in a single row, or with a few bractlets at the base. RECEPTACLE flat. PAPPUS of numerous very soft and slender capillary bristles.—*A vast genus embracing about* 600 *species of herbs and shrubs, with alternate leaves and mostly yellow flowers exceeding the involucre in solitary or corymbed heads.*

* *Rays none; annual.*

1. S. VULGARIS, L. *Common Groundsel.*

Nearly smooth, or at first woolly; *stem* erect, often branching; *leaves* pinnatifid and toothed, clasping, the lowest petioled; *heads* in a corymb, nodding; *pappus* equalling the corolla.

Waste places; common, naturalized. May—Oct. A common weed, growing about houses, rubbish, &c., 6 to 18 inches high, leafy, branching, mostly smooth. *Leaves* thin, bright green. *Heads* terminal, without rays, yellow.

* * *Rays present; heads corymbed; perennial.*

2. S. AUREUS, L. *Golden Senicio. Squaw-weed.*

Smooth or downy-woolly when young; *root-leaves* simple and rounded, the larger mostly cordate, crenate-toothed, long-petioled; the *lower stem-leaves* lyre-shaped, *upper* lanceolate, cut pinnatifid, sessile or partly clasping; *corymb* umbel-like.

A very variable plant, embracing several nominal varieties, of which the following are the most common: Var. 1, *obovatus*, with the root-leaves round obovate, generally found in dry places. Var. 2, *Balsamite*, with the root-leaves oblong, spatulate or lanceolate, sometimes cut toothed, tapering into the petiole. Rocky places; common everywhere. May, June. *Stem* 1 to 2 feet high, branched above, often woolly. *Heads* middle-sized, numerous, on long peduncles which are thickened near the involucre. *Rays* 8 to 12, and with the disk yellow.

3. S. TOMENTOSUS, Michx. *Downy Groundsel.*

White-tomentose and woolly; *radical leaves* oval-oblong, obtuse crenate-toothed, on slender petioles; *stem leaves* oblong, somewhat divided; *corymb* flat-topped.

Dry rocks on the Blue Mountains. Pursh. May, June. *Stem* 1 to 2 feet high, nearly leafless above. *Heads* yellow, larger than in S. *aureus; rays* 12 to 15, elongated.

4. S. ELONGATUS, Pursh. *Elongated Groundsel.*

Smooth; *radical leaves* spatulate, serrate, attenuated into a petiole; *stem leaves* pinnatifid, toothed, very remote; *heads* on elongated peduncles, arranged in a somewhat umbeled corymb.

Rocks on banks of streams near Easton. July, Aug. Resembles var. *Balsamita*, but is destitute of ray-flowers. Beck's Bot.

51. ARNICA, Linn.

Name supposed to be a corruption of *Ptarmica*.

HEADS many-flowered, radiate, the rays pistillate; those of the disk tubular, perfect. INVOLUCRE campanulate; SCALES in 2 rows, equal, lanceolate. RECEPTACLE flat, fimbrillate. ACHENIA spindle-shaped. PAPPUS in a single row, consisting of rather rigid and strongly rough-denticulate bristles.—*Perennial herbs, chiefly natives of alpine regions, with simple stems, opposite leaves and yellow flowers in single or corymbed large heads.*

A. NUDICAULIS, Nutt. *Leopard's-bane.*

Hirsute; *leaves* sessile; the *radical leaves* clustered elliptic-ovate, nerved, entire or slightly toothed; *stem leaves* 1 to 2 pairs, lance-ovate; *heads* terminal, on loosely corymbose peduncles.

Meadows. Chester county. *Darlington;* rare. July, Aug. *Stem* 1 to 2 feet high, with a few peduncle-like branches at the summit, somewhat viscid. *Heads* large; *rays* numerous, deep-yellow, 2 to 3-toothed at the apex; *disk* greenish-yellow.

TRIBE V. CYNAREÆ. THE THISTLE TRIBE.

Heads ovoid, discoid, rarely radiate, homogamous (rarely diœcious), *or heterogamous, with the marginal flowers in a single series; style in the perfect flowers often thickened near the summit.*

52. CENTAUREA, Linn.

Named from the *Centaur*, Chiron.

HEADS many-flowered; the flowers all tubular, the marginal mostly falsely radiate and larger, sterile. INVOLUCRE imbricated, the SCALES margined or appendaged. RECEPTACLE bristly. ACHENIA compressed. PAPPUS of filiform rough bristles in several series, sometimes none.—*Herbs, with alternate leaves, and mostly showy flowers in single heads.*

1. C. JACEA, L. *Brown Knap-weed.*

Stem erect, branched; *leaves* linear-lanceolate; lower broader and toothed, petioled; *involucre* globular, *scales* scarious and torn, the outer pinnatifid; *heads* radiate; *pappus* very short or none.

Waste places. July, Aug. Per. *Stem* about 2 feet high, branching. *Heads* with numerous purple flowers. *Involucre* pale brown, shining. Introduced from Europe. Beck's Bot. This is probably only a variety of the next.

2. C. NIGRA, L. *Black Knap-weed.*

Stem erect, branched; *leaves* scabrous, *lower* angular-lyrate, petioled; *upper* lanceolate; *involucre* globular, scales appendaged, and with a stiff black fringe; *rays* wanting; *pappus* very short.

Meadows and pastures. Aug. Per. *Stem* 2 to 3 feet high, simple or often divided into elongated branches. *Heads* terminal solitary. *Flowers* purple. *Involucre scales* almost black, the teeth brown. Native of Europe, naturalized, and becoming in some places a troublesome weed.

CULTIVATED SPECIES.

3. C. CYANUS, L. *Blue-Bottle. Bachelor's Button.*

Cottony-tomentose; *stem* erect, branched; *upper leaves* linear, entire; *lowermost* toothed or pinnatifid at base; *involucre* globular; *scales* fringe-margined; *rays* longer than the disk; *pappus* very short.

Common in gardens, and in some places naturalized along roadsides, &c. July, Aug. Annual. *Stem* 2 to 3 feet high. *Heads* in terminal peduncles; *rays* few, spreading, white, blue and purple; *disk flowers* smaller, mostly purple. Native of Europe. Justly prized for its handsome flowers which are variable in color.

4. C. AMERICANA, Nutt. *American Centaury.*

Stem erect, sulcate, sparingly branched; *lower leaves* oblong-ovate, repand-dentate, *upper ones* lanceolate, acute, all sessile and glabrous; *heads* few and solitary, very large; *peduncles* thickened at summit; *involucre* depressed-globose, *scales* with a pectinate-pinnate reflexed appendage. Native in Ark. and La. Cultivated in gardens. Aug.—Oct. *Stem* 2 to 4 feet high, with very showy heads of pale-purple flowers. *Scales* appendaged with a pinnate reflexed margin resembling the teeth of a comb.

AMBERBOA, De Candolle. *Pappus of oblong or obovate paleæ, attenuated to the base, all similar, rarely small or none.*

5. C. MOSCHATA, L. *Sweet Sultan.*

Leaves lyrate-dentate; *involucre* subglobose, smooth; *scales* ovate; *ray-flowers* scarcely enlarged, not exceeding the disk; *pappus* none. A handsome border annual from Persia, with white and pale purple, sweet-scented flowers, blooming from July to Oct.

6. C. SUAVOLENS, Willd. (*Amberboa* odorata, DC.) *Yellow Sweet Sultan.*

Lower leaves broadly subspatulate, dentate, *upper leaves* lyrate at base or scarcely pinnatifid; *heads* globose; *ray-flowers* enlarged upwards, longer than the disk; *pappus* chaffy, a little shorter than the fruit. Native of the Levant. *Flower* yellow.

53. CIRSIUM, Tourn. THISTLE.

Gr. *kirsos*, a *swelled vein*, for which the Thistle was a reported remedy.

HEADS many-flowered; the flowers all tubular, perfect and similar, or rarely diœcious. INVOLUCRE ovoid or spherical; SCALES imbricated in many rows, tipped with a point or prickle. RECEPTACLE clothed with soft bristles or hairs. ACHENIA oblong, flattish, not ribbed. PAPPUS of numerous bristles united into a ring at base, plumose to the middle.—*Herbs with sessile alternate leaves, armed with spinose prickles, and large heads of purple or cream colored flowers terminating the stem with branches.*

* *Leaves decurrent.*

1. C. LANCEOLATUM, Scop. *Common Thistle.*

Stem branched, hairy; *leaves* decurrent, pinnatifid, hisped above, woolly beneath; *segments* divaricate and spinous; *scales* linear-lanceolate, spinous, outer ones spreading.

Pastures and roadsides, common every where, introduced. July—Sept. Bienniel. *Stem* 2 to 4 feet high, winged by the decurrent leaves, which are white with deciduous webby hairs beneath, armed with formidable spines at all points. *Heads* numerous, large, purple.

* * *Leaves sessile.*

2. C. ALTISSIMUM, Spreng. *Tall Thistle.*

Stem downy, branching, leafy to the heads; *leaves* roughish hairy above, white, with close wool beneath; *radical leaves* petioled, pinnatifid; *stem leaves* oblong-lanceolate, sinuate toothed; *scales* ovate-lanceolate, spinous, appressed.

Old fields and open woods, common. Per. Aug., Sept. *Stem* 3 to 8 feet high. *Leaves* 6 to 8 inches long, and 1 to 6 wide, oblong-lanceolate, undulate-pinnatifid, or undivided, the lobes or teeth prickly, those from the base pinnatifid; *lobes* short, oblong or triangular. *Heads* large. *Flowers* purple.

3. C. DISCOLOR, Spreng. *Two-colored Thistle.*

Stem grooved, hairy, branched, leafy; *leaves* all deeply pinnatifid, smoothish above, whitened with close wool beneath, the diverging lobes 2 to 3-cleft, linear-lanceolate, prickly-pointed; *involucre* subglobose; *scales* ovate spinous.

Meadows and open woods. Aug., Sept. Bienniel. *Stem* 3 to 6 feet high. *Heads* terminating the branches 1 inch in diameter, with reddish-purple flowers.

4. C. VIRGINIANUM, Michx. *Virginian Thistle.*

Stem woolly, slender, simple or sparingly branched, branches on long peduncles naked; *leaves* lanceolate revolute on the margins, green above, white with close wool beneath, ciliate with prickly bristles; *outer involucre scales* scarcely prickly.

Woods. July, Sept. Per. *Stem* 1 to 3 feet high, covered with a white down, especially towards the summit. *Leaves* entire or sparingly sinuate-lobed, the lower sometimes deeply sinuate-pinnatifid *Heads* ½ inch in diameter; *flowers* purple.

5. C. MUTICUM, Michx. *Swamp Thistle.*

Stem tall, angled, smoothish; *leaves* pinnatifid, acutely cut, somewhat hairy above, whitish with loose webby hairs beneath, when young; *divisions* lanceolate, acute, prickly pointed; *involucre* glutinous and webby, *scales* closely appressed, pointless or barely mucronate.

Swamps and low places, common. Aug. Per. *Stem* 3 to 8 feet high, panicled at the summit, the branches sparingly leafly and bearing single or few naked heads. *Leaves* armed with spines at each angle. *Heads* middle-sized; *flowers* deep purple.

6. C. PUMILUM, Spreng. *Pasture Thistle.*

Stem low, hairy, 1 to 3 flowered; *leaves* lance-oblong, partly clasping, green, somewhat hairy, pinnatifid; *involucre* round-ovate, spinose, *outer scales* prickly-pointed, the inner very slender.

Low or dry fields, common. July, Aug. Biennial. *Stem* 1 to 3 feet high, low and stout, bearing 1 to 3 very large heads which are somewhat leafly bracted at the base. *Leaves* pinnatifid, with short, and cut very prickly-margined lobes. *Heads* 1½ inches broad; *flowers* fragrant 2 inches long, pale purple; *pappus* more than one inch long.

7. C. HORRIDULUM, Michx. *Yellow Thistle.*

Stem stout, webby-haired when young; *leaves* lanceolate, partly clasping, pinnatifid, the short toothed and cut lobes very spiny with yellowish prickles; *heads* large, surrounded at the base by a whorl of leaf-like and very prickly bracts; *involucre* subglobose; *scales* linear, acute, scarcely spinous.

Sandy fields and hills. June—Aug. Per. *Stem* 1 to 4 feet high, short, webby-haired when young, hollow. *Leaves* somewhat clasping, woolly and hairy, armed with stiff spines. *Heads* large, axillary and terminal, with 20 to 30 narrow bracts at base, the outer of which have spines somewhat in pairs. *Flowers* dull yellow, rarely purple.

8. C. ARVENSE, Scop. *Canada Thistle. Cursed Thistle.*

Low, branched; *roots* extensively creeping; *leaves* oblong or lanceolate, smooth, or slightly woolly beneath, sinuate-pinnatifid, prickly-margined; *involucre* round or ovate, with minute spines; *scales* close-pressed, ovate-lanceolate.

Cultivated fields and pastures, naturalized. July, Aug. Per. *Stem* 3 feet high, with a branching panicle at the top. *Leaves* alternate, thickly beset with spines. *Heads* small, numerous, terminal. *Flowers* purple rarely whitish; the involucre is nearly thornless, and is the only part that can be safely handled. A most troublesome weed, which it is extremely difficult to eradicate.

54. ONOPORDON, Vaill. COTTON THISTLE.

HEADS discoid, homogamous. INVOLUCRE ovate-globose; SCALES coriaceous, tipped with a lanceolate prickly appendage. RECEPTACLE deeply alveolate. ACHENIA 4-angled, transversely wrinkled. PAPPUS in several series; BRISTLES numerous, slender not plumose, united at the base into a hoary ring.—*Coarse branching herbs, with decurrent leaves, and large heads of purple flowers.*

1. O. ACANTHIUM, L. *Cotton Thistle. Scotch Thistle.*

Stem and leaves woolly; *leaves* ovate-oblong, sinuate and spinous, decurrent; *involucre scales* linear-subulate, the outer spreading and woolly at the base.

Waste grounds, in some places naturalized. Cultivated in Scotland as the *Scotch Thistle.* July. Bienniel. A tall cottony plant 4 to 6 feet high, branched and winged at the summit, *wings* very spinous. *Involucre* round, cottony, spinous. *Flowers* purple.

55. LAPPA, Tourn. BURDOCK.

Lat. *lappa* a burr, from Gr. *labein*, to lay hold of, a characteristic term.

HEADS many-flowered, the flowers all perfect and similar. INVOLUCRE globose; SCALES imbricated coriaceous and appressed at the base, with a long subulate hooked point. RECEPTACLE bristly. ACHENIA oblong, flattened, wrinkled transeversely. PAPPUS short, of numerous rough bristles, not united at the base, deciduous.—*Coarse biennial weeds, with large alternate heart-shaped and petioled leaves, with wavy margins, and middle-sized heads of purple (rarely white) flowers, solitary or in clusters.*

1. L. MAJOR, Gært. *Common Burdock.*

Upper leaves ovate, *lower* very large, heart-shaped; *involucre* smoothish; *scales* subulate.

Cultivated and waste grounds, common, introduced. July—Oct. *Stem* stout 2 to 4 feet high. *Root leaves* very large, (often 1 to 2 feet long and a foot wide) with wavy edges. The *scales* of the involucre all terminate in a minute, firm hook.

which seizes hold of every thing that passes by. *Heads* globose numerous, often clustered. *Flowers* purple.

L. *Bardana*, a species or variety with pinnatifid leaves, has been observed by Dr. Darlington in Chester county.

56. CNICUS, Vaill.

Gr. *kniso*, to prick; well applied to these herbs.

HEADS many-flowered; the ray-flowers tubular and sterile, shorter than the rest, which are all tubular and perfect. INVOLUCRE swelled, imbricate with deeply spinous scales. RECEPTACLE clothed with capillary bristles. ACHENIA smooth, striate. PAPPUS in 3 series, the outer 10 toothed, the 2 inner each 10 bristled.—*Oriental somewhat woolly herbs, with clasping leaves and large bracted heads of yellow flowers.*

1. C. BENEDICTUS, L. *Blessed Thistle.*

Leaves scarcely pinnatifid, decurrent, dentate and spiny; *involucre* doubly spinous, woolly, bracteate.

Cultivated, scarcely naturalized along roadsides; native of Persia. June. *Stem* 1 to 2 feet high, branching. *Leaves* clasping. *Heads* large, with yellow flowers. It was at one time in great repute as a medicine, but is now considered of no importance.

EXOTICS.

57. CALENDULA, Linn.

Lat. *calenda*, the first day of the month; some species blossom monthly.

HEADS radiate. INVOLUCRE of many equal leaves, in about 2 series. RECEPTACLE naked. ACHENIA of the disk membraneous, curved. PAPPUS none.—*An oriental genus of annual herbs, with alternate leaves and showy flowers, in terminal heads.*

C. OFFICIANALIS, L. *Pot Marigold.*

Visced-pubescent; *stem* erect, branched; *leaves* oblong, acute, mucronate, sessile, subdentate and scabrous-ciliate on the margin; *heads* terminal, solitary; *achenia* keeled, muricate incurved. A common showy garden plant, native of South Europe. *Flowers* single and double, large and brilliant, mostly yellow and orange colored. June—Nov.

58. CARTHAMUS, Linn.

Arabic, *quorthom*, to paint; from its coloring property.

HEADS discoid; FLOWERS all tubular and perfect. INVOLUCRE imbricated, outer bracts foliaceous. RECEPTACLE with bristly chaff. ACHENIA 4-angled. PAPPUS none.—*Oriental herbs.*

1. C. TINCTORIUS, L. *Common Saffron.*

Stem smooth; *leaves* ovate-lanceolate, sessile, spinose-denticulate. Native of

Egypt, common in cultivation. July. Annual. *Stem* branching, 1 to 2 feet high, striate. *Leaves* sub-amplexicaul, smooth and shining, spinose. *Heads* large, terminal, with numerous long and slender flowers, useful in coloring tinctures.

59. XERANTHEMUM, Linn.

Gr. *xeros*, dry, *anthos*, flower; on account of its dry imperishable flowers.

HEADS discoid. INVOLUCRE hemispherical; SCALES radient, opaque, colored, scarious. RECEPTACLE chaffy. PAPPUS bristly-chaffy.—*Annual herbs, natives of South Europe, with radient involucre scales which retain their beauty a great length of time.*

X. ANNUUM, Willd. *Eternal Flower. Straw Flower.*

Stem erect branched; *leaves* oblong-lanceolate, somewhat obtuse, alternate, entire; *heads* large, terminal, solitary; *involucre* scales obtuse, scarious; inner ones of the ray spreading, lanceolate, obtuse. A singularly beautiful plant, cultivated for its imperishable flowers which retain their beauty through the winter. *Stem* 3 to 4 feet high. The radiant involucre scales are of a rich purple, but there are some varieties with red, white, blue and yellow rays; expanding in sunshine, but closing in rainy weather.

SUBORDER II. LIGULIFLORÆ.

Flowers all perfect with ligulate corollas throughout.

SUBTRIBE 6. CICHORACEÆ.

Flowers all perfect and ligulate; branches of the style slender, obtuse, uniformly hairy. *Plants with a milky juice; leaves alternate.*

60. CICHORIUM, Tourn. SUCCORY.

Said to be derived from the Arabic *Chikourych*.

HEADS many-flowered. INVOLUCRE double, the outer series of 5 short spreading scales, the inner of 8 to 10 scales. ACHENIA striate. PAPPUS of numerous very small chaffy scales, forming a short crown.—*Branching perennials, with toothed or pinnatifid radical leaves, and sessile axillary and terminal heads of bright blue showy flowers.*

1. C. INTYBUS, L. *Common Succory* or *Cichory.*

Radical leaves runcinate; *stem leaves* small, oblong or lanceolate, partly clasping, toothed or entire; *heads* 2 or 3 together.

Cultivated and somewhat naturalized in grass fields, roadsides, &c. *Stem* 2 to 3 feet high, round, rough, with few long branches. *Heads of flowers* 1 to 2 inches in diameter, sky-blue, somewhat remote on the long branches. *Corollas* flat, 5-toothed. July, Sept. Native of Europe.

2. C. ENDIVIA, L. *Endive.*

Peduncles axillary, in pairs, one of them elongated and 1-headed, the other very short, about 4-headed; *heads* capitate. A hardy plant from the East Indies, esteemed and cultivated for salad.

61. KRIGIA, Shreber.

In honor of Daniel Krig, an early German botonical collector in this country.

HEADS 15 to 20 flowered. INVOLUCRE in a single series with 8 to 12 scales. RECEPTACLE naked. ACHENIA turbinate, many striate or angled. PAPPUS double; the *outer* of 5 broad, chaffy, rounded scales; the *inner* of as many alternate slender bristles.—*Small annual or biennial acaulescent plants, with radical, lyrate or toothed leaves and solitary heads with* 20 *to* 30 *yellow flowers.*

2. K. VIRGINICA, Willd. *Dwarf Dandelion.*

Leaves lyrate, smooth; *scapes* several 1-flowered; *involucre* smooth.

Dry sandy soil. May—July. *Scapes* 2 to 10 inches high, smooth. *Primary leaves* roundish, entire. *Heads* solitary, small. *Flowers* deep yellow. This plant continues in bloom for some time, during which it varies greatly in the length of the scape.

62. CYNTHIA, Don.

Probably named after *Mount Cynthus.*

HEADS many-flowered. INVOLUCRE nearly simple; SCALES in one or two rows. ACHENIA short striate. PAPPUS double; the outer of numerous very small chaffy bristles; the inner of numerous elongated bristles.—*Perennial herbs, with alternate or all radical leaves and rather showy single heads of* 15 *to* 20 *yellow flowers, on scapes or naked peduncles.*

1. C. VIRGINICA, Don. *Virginian Cynthia.*

Smooth and glaucous; *stem* scape-like, often 2 or 3 parted, few-leaved; root-*leaves* petioled, lyrate, sinuate-dentate or pinnatifid; *stem-leaves* lanceolate, clasping, nearly entire; peduncles 3 to 5.

Moist banks and low open woods. June. July. *Stem* 1 foot or more high, often 2 or 3 from one root, divided into long slender branches, with a clasping leaf at the forks. *Heads* solitary, middle sized orange yellow.

63. LEONTODON, L., Juss. HAWKBIT.

Gr. *leon*, lion, and *odons*, a tooth; in allusion to the toothed margins of the leaves.

HEADS many-flowered. INVOLUCRE scarcely imbricated; SCALES lanceolate, acuminate with several bractlets at the base. ACHENIA spindle-shaped, striate, all alike. PAPPUS persistent, composed of plumose bristles which are enlarged and flattened towards the base.—*Low and stemless perennials, with toothed or pinnatifid root-leaves and one or two heads of yellow flowers borne on a scape.*

L. AUTUMNALE, L. *Autumnal Hawkbit.*

Leaves more or less pinnatifid; *scape* branched; *peduncles* several, thickened at the summit and furnished with small scaly bracts; *involucre* ovoid-oblong.

A European plant, naturalized in meadows and roadsides. July—Sept. *Scape* 16 to 18 inches high spreading, branched into a few peduncles. *Leaves* all radical, spreading, 6 inches long, with deep round sinuses, and covered with remote hairs. *Heads* 1 inch in diameter, bright yellow, resembling the *Dandelion.*

64. HIERACIUM, Tourn. HAWKWEED.

Gr. *hierak*, a hawk, supposed to strengthen the vision of birds of prey.

HEADS many-flowered. INVOLUCRE more or less imbricated, ovoid; SCALES linear, obtuse. ACHENIA oblong or columner, striate. PAPPUS a single row of tawny fragile capillary bristles.—*Perennial herbs, with entire or toothed alternate leaves, and single or panicled heads of yellow flowers·*

1. H. SCABRUM, Michx. *Rough Hawkweed.*

Stem erect, leafy, rough-hairy; *leaves* obovate or oval, entire or somewhat denticulate, hairy, the lower narrowed, at the base the upper closely sessile; *panicle* stiff flexuous, at first racemose, at length rather corymbose.

Woods and dry hills. July—Aug. *Stem* 1 to 3 feet high, round, striate, rather stout. *Leaves* subacute, often purplish as well as the stem. *Involucre* 40 to 50-flowered, densely clothed with glandular bristles. *Heads* large, with yellow flowers. *Achenia* obtuse at apex, bright red, with a tawny pappus.

2. H. GRONOVII, L, *Gronovius's Hawkweed.*

Stem erect, wand-like, mostly simple, leafless and paniculate above, leafy and hairy below; *leaves* oblong and obovate, nearly entire, hairy; *involucre* and peduncles sparingly glandular-bristly.

Dry sterile soil, common. July—Aug. *Stem* 1 to 4 feet high, furnished with a few leaves below, naked above, and forming a long and narrow panicle. *Heads* rather small, 20 to 30-flowered. *Flowers* yellow. *Achenia* spindle-shaped, with a very tapering summit.

3. H. VENOSUM, L. *Veiny Hawkweed, Rattlesnakeweed.*

Stem scape-like, naked or with a single leaf, smooth and slender, forking above into a spreading loose corymb; *leaves* obovate oblong and lanceolate, entire or obscurely denticulate, hairy on the margin and midrib beneath.

Dry soil and pine woods, common. June—Aug. *Stem* 1 to 2 feet high. *Radical leaves* spreading on the ground, colored with purple veins. *Heads* 20-flowered on very slender peduncles. *Rays* rather large for the size of the head, yellow. Reputed as an antidote for the poison of the rattlesnake.

4. H. PANICULATUM, L. *Panicled Hawkweed.*

Stem slender, leafy, paniculate, hairy below; *leaves* lanceolate, acute at both ends, slightly toothed, smooth; *heads* in a loose panicle on slender spreading peduncles; *achenia* short, not tapering at the summit.

Damp woods, common. August. *Stem* 1 to 3 feet high, diffusely branched. *Leaves* thin, 2 to 4 inches long. *Heads* small, 12 to 20 flowered. *Flowers* yellow. *Achenia* ribbed, reddish-brown.

65. NABULUS, Cass.

Name probably from the Greek *nabla*, a harp, in allusion to the lyrate leaves of some species.

HEADS 15 to 30 flowered. INVOLUCRE cylindrical. SCALES 5 to 14, linear, in a single row, with a few small bractlets at the base. ACHENIA linear-oblong, striate or grooved, truncate at the apex. PAPPUS in many series of yellow brownish, roughish capillary bristles.—*Perennial herbs with spindle-shaped, bitter tubers, upright leafy stems, with variable leaves and racemose-panicled, mostly nodding heads, with greenish-white or cream-colored flowers, sometimes tinged with purple.*

* *Involucre smooth or nearly so, 5 to 12-flowered.*

1. N. ALBUS, Hook. *White Lettuce, Rattlesnake-root.*

Smooth and glaucous; *stem* tall; *leaves* angular-hastate or angulate, sinuate-toothed, or 3 to 5-cleft; the uppermost oblong and undivided; *racemes* short, paniculate; *involucre* with about 8 scales, 8 to 12-flowered. Var. *Serpentaria* is a form with deeply divided leaves, with their margins often rough-ciliate.

Woods and hill sides, in rich soils, common. Aug., Sept. *Stem* 2 to 5 feet high, simple or much branched. *Heads* numerous, in a loose corymbed panicle. *Involucre* purplish. *Flowers* white. *Pappus* deep cinnamon-color. *Achenia* yellow. Reputed as a remedy for the bite of the rattlesnake.

2. N. ALTISSIMUS, Hook. *Tall White Lettuce.*

Smooth; *stem* tall and slender, branched; *leaves* all petioled, undivided, or the lower 3 to 5-cleft or parted; the lobes or leaves acuminate, repandly toothed or denticulate; *involucre* slender, of 5 scales, 5 to 6-flowered; *heads* in small axillary and terminal loose clusters, forming a long leafy panicle.

Rich moist woods. Aug., Sept. *Stem* 3 to 6 feet high, erect. *Leaves* very variable, sometimes cordate, deltoid or triangular-hastate, with naked or winged petioles. *Heads* nodding with yellowish white flowers, *Pappus* dirty white, or pale straw color.

3. N. FRASERII, DC. *Lion's-foot. Gall-of-the-earth.*

Nearly smooth; *stem* erect, branched; *leaves* mostly deltoid, roughish; *lower* 3 to 7-lobed, on margined petioles; *upper* nearly sessile and undivided; *involucre* smoothish, of about 8 scales, 8 to 12-flowered; *heads* in corymbose panicles. Var. *integrifolia* has the thickish leaves all undivided and merely toothed.

Dry sandy or sterile soil. Aug.—Oct. *Stem* 1 to 4 feet high. *Leaves* very variable. *Involucre* greenish or purplish, sometimes slightly bristly. *Flowers* cream-color, sometimes with a tinge of purple. *Pappus* dull straw-color.

66. TARAXACUM, Haller. DANDELION.

Gr. *taraktikos*, cathartic; on account of its once celebrated medicinal properties.

HEAD many-flowered. INVOLUCRE double, the outer of short scales; the upper of long linear scales, erect in a single row. ACHENIA oblong ribbed prolonged into a long beak, crowned with the copious, white capillary pappus.—*Acaulescent perennial herbs, with radical runcinate leaves and slender naked hollow scapes, bearing a single large head of yellow flowers.*

1. T. DENS-LEONIS, Desf. *Common Dandelion.*

Smooth or at first pubescent; *leaves* unequally and deeply runcinate; outer involucre scales reflexed.

Pastures and fields, common everywhere. April—Oct. After blossoming the inner involucre closes for a time, the slender beak elongates and raises up the pappus while the fruit is forming, the whole involucre is then reflexed, exposing to the wind the naked seeds with the pappus displayed in an open globular form. The *leaves* are used in spring as a pot-herb.

67. LACTUCA, Tourn. LETTUCE.

The ancient name of Lettuce, from *lac*, milk in allusion to the milky juice.

HEADS several-flowered. INVOLUCRE cylindric; SCALES imbricated in 2 or more sets of unequal lengths. RECEPTACLE naked. ACHENIA flat, obcompressed, abruptly produced into a long thread-like beak. PAPPUS of very soft and white capillary bristles.—*Leafy-stemed herbs, with panicled heads of various-colored flowers.*

1. L. ELONGATA, Muhl. *Wild Lettuce.*

Stem tall and stout; *leaves* partly clasping, pale beneath; the upper lanceolate and entire; the lower runcinate-pinnatifid; *heads* in a long and narrow panicle, varies greatly. The var. *integrifolia* is mostly smooth, with the leaves nearly all entire and the flowers yellow or bluish. Var. *sanguinea* is smaller, mostly hairy, with the leaves chiefly runcinate, and the flowers variously colored. Gr.

Rich damp soil, hedges and thickets, common. July—Sept., Biennial. *Stem* 2 to 8 feet high, often purple, bearing a leafless, elongated, sometimes corymbose-spreading panicle of numerous heads of flowers. *Corollas* yellow. *Achenia* oblong, compressed, about the length of the beak.

2. SATIVA, L. *Garden Lettuce. Sallad.*

Stem corymbose; *leaves* suborbicular, those of the stem cordate. A well known cultivated exotic, with several varieties. The var. *capitata* has the leaves so thick as to form heads like the cabbage. *Heads* numerous, small, with yellowish corollas. The milky juice contains opium.

68. MULGEDIUM, Cass.

Lat. *mulgeo,* to milk.

HEADS many-flowered. INVOLUCRE calyculate-imbricate, the outer scales much shorter than the inner. RECEPTACLE naked, honey-combed. ACHENIA smooth, compressed, attenuated in a beak at the summit, appearing as if a part of the achenia, and expanded at the apex into a ciliate disk, which bears copious pappus of soft capillary bristles.—*Leafy-stemmed herbs, with panicled or racemed heads of chiefly blue flowers.*

1. M. ACUMINATUM, DC. *Sharp-leaved Mulgedium.*

Smooth; *stem* panicled above; *stem-leaves* ovate and ovate-lanceolate, pointed merely toothed, sometimes hairy on the midrib beneath, contracted at the base into a winged petiole; the *lower ones* sometimes runcinate or sinuate; *heads* in a thyrse-like panicle; *peduncles* somewhat scaly.

Borders of thickets and shady woods. Aug.—Sept., Biennial. *Stem* 3 to 6 feet high, erect, smooth, simple. *Leaves* 3 to 6 inches long, the lower ones often deltoid-hastate or truncate at the base, narrowed into a winged petiole. *Heads* small, not numerous, in a widely spreading terminal panicle. *Scales* dark purple. *Corollas* blue.

2. M. FLORIDANUM, DC. *Gall-of-the-earth.*

Nearly smooth; *stem* erect, paniculate above; *leaves* all lyrate or runcinate, the divisions sharply toothed; *heads* in a loose erect panicle.

Rich soil, woods and road sides. July—Aug., Biennial. *Stem* 3 to 6 feet high, purplish or somewhat glaucous. *Leaves* 4 to 8 inches long, variable in form, the *upper* triangular; *lower ones* petioled. *Heads* rather small, in an oblong terminal panicle. *Flowers* blue. *Pappus* dirty white. Pursh states that this plant is used as a cure for the bite of the rattlesnake, and is known by the name of Gall-of-the-earth.

3. M. LEUCOPHEUM, DC. *Tall Mulgedium.*

Nearly smooth; *stem* tall, very leafy; *leaves* irregularly pinnatifid, sometimes runcinate, coarsely toothed, the uppermost often undivided; *heads* in a large and dense compound panicle.

Low grounds, common. July—Sept., Biennial. *Stem* 3 to 12 feet high. *Leaves* 5 to 12 inches long, irregularly divided in a runcinate or pinnatifid manner, the segments repand-toothed, those of the root on long stalks, the upper ones sessile. *Heads* small, with pale blue or yellowish corollas. *Pappus* tawny white.

69. SONCHUS, Linn. SOW-THISTLE.

The ancient Greek name.

HEADS many-flowered, dilated at base. INVOLUCRE imbricated. RECEPTACLE naked. ACHENIA flattened laterally, ribbed or striate, not beaked. PAPPUS of numerous soft and very white, fine capillary bristles.—*Leafy-stemmed herbs, chiefly smooth and glaucous, with mostly spinulose leaves and corymbed or umbellate heads of numerous yellow flowers.*

1. S. OLERACEUS, L. *Common Sow-Thistle.*

Stem-leaves runcinate-pinnatifid, or rarely undivided, slightly toothed, with soft spiny teeth, clasping by a heart-shaped base, the auricle acute; *involucre* downy when young; *achenia* striate, wrinkled transversely.

Waste places, naturalized. July—Sept. *Stem* 2 to 4 feet high, hollow, angular. *Leaves* apparently clasping, with large retreating lobes at base, wavy and serrated in a runcinate manner. *Heads* in a somewhat umbelled corymb. *Flowers* yellow. *Pappus* very white and silky. Introduced from Europe.

2. S. ASPER, Vill. *Spiny-leaved Sow-Thistle.*

Stem-leaves mostly undivided, undulate or slightly runcinate, spinulose-toothed, cordate clasping; *lower ones* spatulate or oval; *heads* umbellate-corymbose; *achenia* margined, 3-nerved on each side, smooth.

Fields and waste places. Aug.—Sept., Annual. *Stem* about 2 feet high, smooth or slightly hairy. *Leaves* with numerous short, spiny teeth; the upper ones clasping so as to appear perfoliate. *Heads* small, somewhat umbelled. *Flowers* yellow. Introduced from Europe.

3. S. ARVENSIS, L. *Corn Sow-Thistle.*

Root creeping; *stem* erect, smooth; *leaves* runcinate-pinnatifid, spiny-toothed, cordate clasping, the auricle obtuse; *peduncles* and *involucre* bristly; *achenia* transversely wrinkled on the ribs.

Near cultivated grounds. Aug.—Sept. Per. *Stem* angular, about 2 feet high. *Heads* large with deep yellow flowers. Introduced from Europe and sparingly naturalized.

70. TRAGOPOGON, Linn. SALSIFY.

Gr. tragos, a goat, *pogon,* a beard; in allusion to the tawny, showy pappus.

INVOLUCRE simple, of many leaves. RECEPTACLE naked. PAPPUS plumose. ACHENIA longitudinally striate, contracted into a long, filiform beak.—*Bienniel European herbs, with long linear grass-like leaves, and terminal solitary heads.*

1. T. PORRIFOLIUS, L. *Salsify. Vegetable Oyster.*

Leaves long, linear, undivided, straight; *peduncles* thickened upwards; *involucre* much longer than the corolla. *Stem* 3 to 4 feet high. *Flowers* terminal, solitary, large, bluish purple or sometimes pale straw-color. Native of Europe, cultivated for its long tapering root, which is nutritious, and when properly prepared has a mild sweetish taste, similar to that of the oyster.

71. CATANANCHE, Linn.

Gr. *kata, anagke,* from necessity; it *must necessarily* be admired.

INVOLUCRE imbricated, scarious. RECEPTACLE paleaceous. PAPPUS paleaceous, 5-leaved; PALEÆ awned.—*Annual oriental herbs, with alternate leaves, and solitary heads of showy flowers.*

1. C. CŒRULEA, L. *Blue-flowered Catananche.*

Leaves linear and lanceolate, villous somewhat bipinnatifid at base; *involucre scales* ovate, mucronate. A handsome annual from South Europe, 2 to 3 feet high. *Heads* solitary, on long peduncles. *Flowers* blue, ligulate. *Corollas* toothed at apex. July—Sept.

ORDER 59. **LOBELIACEÆ.**—*Lobelia Family.*

Herbs (often with milky juice) with alternate leaves and scattered flowers, an irregular monopetalous 5-lobed corolla split down to the base on one side; the 5 *stamens free from the corolla, and united into a tube both by their filaments and their anthers.—Calyx-tube adherent to the many seeded capsule.* STYLE 1; STIGMA fringed. SEEDS anatropous.

1. LOBELIA, Linn. CARDINAL FLOWER.

In honor of Matthias de Lobel, a Flemish botanist of the close of the 16th century.

CALYX 5-cleft, with a short ovoid tube. COROLLA irregular, cleft on the upper side, 2-lipped; *lower lip* 3-cleft, *upper lip* of 2 rather erect lobes. STIGMA 2-lobed. CAPSULE 2-celled, many-seeded, opening at the top.—*Herbaceous plants, with alternate leaves, and blue, white or red flowers, in axillary, or terminal, bracted racemes,*

* *Flowers deep red.*

1. L. CARDINALIS, L. *Cardinal Flower.*

Smoothish; *stem* erect, simple, pubescent; *leaves* oblong-lanceolate, acute at both ends, slightly toothed; *raceme* elongated, rather one sided; *pedicels* much shorter than the leaf-like bracts; *stamens* longer than the corolla.

Low grounds, common. July, Aug. Perennial by offsets. *Stem* 2 to 3 feet high, often quite smooth. *Leaves* 2 to 4 inches long, ¾ to 1¼ inch wide, usually denticulate. *Flowers* few or numerous, in a nodding raceme, very showy, and intensely red. *Corolla* 1½ inch in length.

* * *Flowers blue, or white.*

2. L. SYPHILITICA, L. *Blue Cardinal Flower.*

Stem erect, somewhat hairy and simple; *leaves* ovate or ovate-lanceolate, acute, slightly toothed, somewhat hirsute; *raceme* or *spike* leafy; *calyx* hispidly-ciliate with the sinuses reflexed.

Wet meadows and along streams, common. Aug. Per. A handsome plant, 1 to 3 feet high. *Leaves* broader at base, acute at each end, pilose. *Calyx lobes* half the length of the corolla, the obtuse reflexed auricles shorter than the tube. *Flowers* large on short peduncles, each solitary in the axil of an ovate-lanceolate bract. *Corolla* bright blue or purplish, rarely white. I found the white variety growing in company with the deep blue in a meadow near Mooresburg, Montour Co.

3. L. PUBERULA, Michx. *Downy Lobelia.*

Minutely downy pubescent; *stem* erect, simple; *leaves* ovate or oblong, obtuse, denticulate with glandular teeth; *flowers* in a one-sided spike, the leafy bracts ovate, acute, serrate, as long as the flower; *calyx* hirsute at base the lanceolate ciliate segments as long as the tube of the corolla.

Moist grounds, rare. Aug., Sept. Per. *Stem* 1 to 2 feet high, scarcely furrowed. *Leaves* 1 to 2 inches long, and half as wide, the lower ones broadest towards the end, covered with a short down or silky pubescence. *Flowers* large on very short pedicels, in a one-sided raceme. *Corolla* of a bright purplish blue.

4. L. SPICATA, Lam. *Spiked Lobelia.*

Somewhat pubescent; *stem* slender, and very simple; *leaves* obtuse, pubescent nearly entire; *radical leaves* spatulate or oblong, those of the stem oblong-lanceolate; *raceme* spiked one-sided, elongated; segments of the calyx subulate, nearly as long as the tube of the corolla.

Open woods and fields, common. July, Aug. Per. *Stem* 1 to 2 feet high, few-leaved, ending in a long wand-like raceme. *Flowers* numerous, crowded, each axillary to a short bract, pale-blue.

5. L. INFLATA, L. *Indian Tobacco. Eye-bright.*

Hairy; *stem* low, panicled, branched above; *leaves* ovate-lanceolate, unequally toothed, the lower obtuse, sessile; *racemes* leafy, somewhat paniculate; *capsule* inflated, ovoid.

Fields and woods, common. July—Sept. Bienniel. *Stem* 1 to 2 feet high, becoming branched in proportion to the luxurience of its growth. *Flowers* small, pale blue, on pedicels much shorter than the pointed bracts; lobes of the smooth calyx as long as the corolla. This plant is much used in the Thompsonian practice of medicine, and is an invaluable emetic, as well as a powerful expectorant, seldom failing to give almost instantaneous relief in attacks of croup, asthma, &c.

2. CLINTONIA, Douglass.

CALYX 5-sepaled, subequal. COROLLA 2-lipped, lower lip cuneate, 3-lobed; upper erect, 2-parted. STAMENS incurved, united into a tube. CAPSULE silique-form, dry, chartaceous, 1-celled, many-seeded, dehiscent by 3 strap-shaped valves.—*Procumbent annual herbs, with minute leaves and axillary solitary flowers.*

1. C. ELEGANS, Doug. *Elegant Clintonia.*

Smooth; *stem* slender, angular, sparingly branched; *leaves* sessile, ovate, 3-veined: *ovary* sessile, long acuminate, triangular, contorted, much longer than the leaves. A beautiful garden annual, native of the Rocky Mountains. *Flowers* of the most intense blue; *corolla* with a white spot in the middle of the lower lip.

ORDER 60. CAMPANULACEÆ.—*Bell-flower Family.*

Herbs with a milky juice, alternate leaves, no stipules, and mostly blue, scattered flowers; the calyx generally 5-cleft, adherent to the ovary; the regular bell-shaped corolla 5-cleft, valvate in aestivation; the 5 stamens inserted with the corolla on the calyx, free, and usually distinct. STYLE 1, beset with collecting hairs above; STIGMAS 2 or more. CAPSULE 2 or more celled, many-seeded.

1. CAMPANULA, Tourn. BELL-FLOWER.

Lat. *campanula*, a little bell; from the form of the corolla.

CALYX 5-cleft. COROLLA mostly bell-shaped, 5-lobed. STAMENS 5, seperate, the filaments broad and membranaceous at the base. STIGMAS 3 to 5. CAPSULE 3 to 5-celled, opening by lateral valves.—*Mostly perennial herbs, with alternate leaves, and terminal spicate, or axillary flowers.*

1. C. ROTUNDIFOLIA, L. *Rock Bell-flower. Hair Bell.*

Stem slender, branching; *root-leaves* round heart-shaped, crenate, on long petioles; *stem leaves* linear, narrow, entire, smooth; *flowers* few, nodding; *calyx-lobes* awl-shaped.

On damp rocks and rocky streams, common. June—Oct. An exceedingly delicate species from 6 to 15 inches high, smooth. The *root-leaves* generally decay on the opening of the flowers, when the specific name appears wholly inappropriate. *Stem-leaves* 2 inches long and scarcely a line in width. *Flowers* terminal, in a loose panicle, bright blue.

2. C. APARINOIDES, Pursh. *Slender Bell-flower.*

Stem weak, slender, simple, somewhat 3-angled; *leaves* linear-lanceolate; *peduncles* diverging, slender, 1-flowered; *calyx-lobes* triangular, half the length of the bell-shaped corolla.

Bogs and wet meadows, common. July, Aug. *Stem* 8 to 20 inches high, rough backwards on the angles, by which it supports itself upright among the grass. *Leaves* smooth on the upper surface, denticulate, the margin and veins rough backwards. *Flowers* small, nearly white, on thread-like, flexuous peduncles at the top of the stem.

3. C. AMERICANA, L. *American Bell-flower.*

Stem tall and wand-like, nearly simple; *leaves* ovate-lanceolate, accuminate at both ends, serrate, sparingly hairy, thin, the lower somewhat heart-shaped; *flowers* axillary, sessile; *style* exserted; lobes of the calyx awl-shaped.

Moist rich soil, common. July, Aug. A tall erect ornamental species, sometimes cultivated, 2 to 3 feet high. *Stem* nearly smooth. *Leaves* ending in a long point, smooth, with fine teeth. *Flowers* numerous, sessile or on short stalks, one or more in each axil, forming a terminal leafy raceme or spike, sometimes 2 feet long. *Corolla* nearly wheel-shaped, deeply 5-cleft, blue.

4. C. PYRAMIDALIS, L. *Pyramidal Bell-flower.*

Stem upright, elongated, branched below; *leaves* ovate-cordate acuminate, petiolate; *upper ones* lanceolate; *peduncles* about 3-flowered. Native of France. July—Sept. A showy perennial cultivated in gardens for its showy bell-shaped flowers, which are borne on pyramidal branches, rising from the border like a Chinese pagoda.

5. C. MEDIUM, L. *Canterbury Bell.*

Stem simple, erect, hispid; *leaves* lanceolate, obtusely serrate, sessile, 3-viened at base; *flowers* erect. An ornamental Biennial from Germany, of the easiest culture. *Stem* 2 to 3 feet high, branched, rough with bristly hairs. *Flowers* very large, the base broad, limb-reflexed, mostly of a deep blue. Several varieties are cultivated with blue, purple and white corollas. June—Sept.

6. C. PERSICIFOLIA, L. *Peach-leaved Bell.flower.*

Stem angular, erect; *leaves* rigid, obscurely crenate-serrate, *radical* oblong obovate, *stem-leaves* lance-linear; *corolla* large, broadly-companulate. A beautiful species, native of Europe, ranked among the most ancient ornaments of the English parterres. *Flowers* large, blue, varying to white. June—Sept.

7. C. CARPATICA, L. *Carpatic Bell-Flower.*

Diffuse, spreading; *stem* trailing, somewhat angled; *leaves* heart-shaped, coarsely serrate, wavy on the margin, with a few scattered hairs on the midrib beneath; *flowers* terminal; *calyx-lobes* linear-subulate, spreading; *stigma* 3-cleft, the lobes spreading. A beautiful perennial, native of the Carpatic Mountains. July—Oct. *Stems* prostrate forming dense patches. *Leaves* 1 to 2 inches long, ½ to 1 inch wide on petioles 2 to 5 inches long. *Flowers* purplish-blue 1 to 1½ inch in diameter on peduncles 4 to 8 inches long.

2. SPECULARIA, DC.

Name from *Speculum Veneris*, the ancient name of one of the European species.

CALYX 5- (rarely 3 to 4)-lobed, tube elongated. COROLLA wheel-shaped, 5-lobed. STAMENS 5, distinct, half as long as the corolla; FILAMENTS hairy, shorter than the anthers. STYLE included, hairy; STIGMAS 3. CAPSULE elongated, prismatic, 3-celled, opening by 3 small lateral valves.—*Low annual herbs, with sessile, axillary and terminal, erect flowers.*

1. S. PERFOLIATA, DC. *Clasping Bell-flower.*

Somewhat hairy; *leaves* roundish or ovate, cordate, amplexicaul, crenate; *flowers* sessile, solitary or three together in the axils of the leaves

Dry hills, or open fields, common. May—Aug. *Stem* 9 to 15 inches high, mostly simple. *Leaves* clasping by the heart-shaped base, distant, alternate. *Flowers* small, purple; *corolla* with spreading segments; *calyx* segments acute, lanceolate.

2. S. SPECULUM, L. *Venus' Looking-glass.*

Stem diffuse, very branching; *leaves* oblong-crenate; *flowers* solitary. July, Aug. Native of Europe. A pretty border flower. *Stem* 6 to 12 inches high, with spreading branches. *Flowers* blue, axillary; *corolla* salver-shaped, resembling in form, a little round concave mirror. Towards evening the corollas fold up into a pentagonal figure, enclosing the parts of fructification, and securing from the damp air until they are again opened by the morning sun.

ORDER 61. **ERICACEÆ.**—*Heath Family.*

Shrubs, sometimes herbs, with simple alternate or opposite leaves, often evergreen; without stipules, and regular flowers or nearly so, the stamens as many or twice as many as the 4 *to* 5*-lobed corolla, and inserted with it.* ANTHERS 2-celled, mostly appendaged, opening by chinks or pores. OVARY 4 to 10-celled; STYLE 1. FRUIT capsular, baccate, or drupaceous.

SUB-ORDER 1. VACCINEÆ. WHORTLEBERRY FAMILY.

OVARY adherent to the tube of the calyx, becoming a berry or drupe-like fruit, crowned with the calyx-teeth. *Shrubs with scattered leaves.*

1. VACCINIUM, Linn. WHORTLEBERRY.

CALYX adherent to the ovary, 4 to 5-toothed. COROLLA ovoid, bell-shaped, urn-shaped or cylindrical, 4 to 5-cleft. STAMENS 8 to 10. STYLE erect, longer than the stamens. BERRY globose, 4 to 5-(rarely 10)-celled; *cells* many-seeded.—*Shrubs or under-shrubs, with scattered leaves, solitary or racemose, white or reddish flowers, and succulent many-seeded berries.*

SEC. 1. GAYLUSSACIA, *Torr. & Gray. Flowers in lateral bracted racemes. Corolla* 5*-cleft; stamens* 10.

* *Leaves thick and evergreen, not resinous dotted.*

1. V. BRACHYCERUM, Michx. *Box-leaved Huckleberry.*

Low, very smooth; *leaves* oval, finely crenate-toothed; *racemes* short and nearly sessile; *pedicels* very short; *corolla* cylindrical-bell-shaped. (Gaylussacia brachycera, Torr & Gr.)

Hillsides, rare. May—June. I found this species in the summer of 1850 very abundant on a small hill near Bloomfield, Perry County. *Stem* 8 to 12 inches high, with leaves resembling those of the Box.

** *Leaves deciduous, entire; whole plant more or less resinous dotted.*

2. V. FRONDOSUM, Willd. *Blue-tangle. High Blueberry.*

Smooth; *branches* slender and divergent; *leaves* obovate-oblong, obtuse, pale, glaucous beneath; *racemes* slender, loose, with oblong or linear bracts; *corolla* globular-bell-shaped. (Gaylussacia frondosa, Torr. & Gr.)

Low sandy woods, common. May—June. *Shrub* 3 to 6 feet high, with smooth slender branches and grayish bark. *Leaves* twice as long as wide. *Racemes* lateral, few-flowered. *Flowers* small, nearly globose, reddish-white. *Berries* large, globose, blue, covered with a glaucous bloom when mature, sweet.

3. V. RESINOSUM, Ait. *Black Huckleberry or Whortleberry.*

Much branched, rigid, slightly pubescent when young; *leaves* petiolate, oval, oblong-ovate or oblong, obtuse, very entire, sprinkled with shining resinous dots;

racemes short, clustered, one-sided, bracteate; *corolla* ovoid-conical or at length cylindrical, contracted at the mouth, at length open. (Gaylussacia resinosa, Torr. & Gr.)

Woods and swamps, common. May—June. *Shrub* 1 to 3 feet high, bushy. *Leaves* 1 to 2 inches long, ⅓ as wide, rarely acute, shining beneath with resinous spots, on petioles 1 line in length. *Flowers* reddish in lateral, dense, corymbose clusters, small drooping. *Corolla* greenish or yellowish-purple, longer than the stamens, but shorter than the style. *Berries* black, globose, without bloom, sweet and eatable, ripe in August.

Sec. 2. VACCINIUM proper. *Flowers in solitary clusters or racemes, white or reddish; stamens* 8 *to* 10.

* * *Ovary more or less completely* 10*-celled by false partitions; corolla* 5*-lobed.*

4. V. STAMINEUM, L. *Deerberry. Squaw Huckleberry. White Whortleberry.*

Diffusely branched, *young branches* pubescent; *leaves* ovate or oval, acute, very entire, glaucous beneath; *pedicels* solitary, axillary, filiform, nodding; *corolla* bell-shaped, spreading; *anthers* exserted, with 2 awns on the back.

Dry woods, common. May, June. *Shrub* 2 to 3 feet high. *Leaves* 1 to 2 inches long, ¼ to ½ as wide, mostly rounded at base and on very short petioles. *Flowers* on long, slender pedicels, arranged in loose, leafy racemes. *Corolla* white, spreading. *Stamens* conspicuously exserted, but shorter than the style. *Berries* large, greenish-white, bitter.

5. V. PENNSYLVANICUM, Lam. *Common Low Shining-leaved Blueberry.*

Dwarf, smooth; *leaves* ovate-lanceolate or oblong-lanceolate, acute at each end, minutely serrulate, thin; *corolla* short, ovoid-cylindrical.

Thickets and dry hills, in hard soil, common. May. A low undershrub, 6 to 15 inches high, growing in dense patches. *Branches* green, angled, with 2 pubescent lines. *Leaves* sub-sessile, crowded ½ to 1 inch long, ¼ to ½ wide. *Flowers* reddish-white, ¼ inch long, with mostly colored bracts. *Berries* abundant, large and sweet, bluish-black, somewhat glaucous, ripening early in July.

6. V. CORYMBOSUM, L. *High Swamp Whortleberry.*

Tall; *flowering branches* almost leafless; *leaves* oblong-oval, rather acute at each end, nearly entire, pubescent when young; *racemes* short, sessile, bracteate; *corolla* ovoid-cylindrical.

Swamps and marshy places, common. June. A tall shrub, 4 to 8 feet high, with a few stragling branches, which are green or purplish when young. *Leaves* smooth on both sides, (when young somewhat downy on the veins). *Flowers* numerous, nodding, generally appearing in advance of the leaves, on short bracted pedicels, crowded near the summit of the naked branches. *Corolla* large, ½ inch in diameter, purplish-white, contracted at the mouth. *Berries* large, sub-acid, covered with a glaucous bloom; ripening in July and August.

7. V. FUSCATUM, Ait. *Black Swamp Whortleberry.*

Tall; *leaves* oval obovate or oblong, downy beneath, and also usually on the veins above; *racemes* short; *corolla* cylindrical.

Marshes, common. June. *Stem* 5 to 9 feet high. *Leaves* 2 to 3 inches long when full grown, at length thickish and somewhat shining above, but always soft downy underneath. *Berry* purplish-black, destitute of bloom, crowned with very conspicuous calyx-teeth. Gray. This may prove to be only a variety of *V. corymbosum.*

8. V. VACCILLANS, Solander. *Sugar Whortleberry.*

Low; *branches* angular, smooth; *leaves* oval or obovate, acute or rather obtuse, serrulate, smooth on both sides, glaucous beneath; *racemes* very short, clustered; *corolla* cylindrical-bell-shaped.

Dry hills and open woods, common. May. *Stem* 1 to 2 feet high, with numerous yellowish-green branches. *Leaves* pale and dull, fringed with bristly or glandular hairs, which tip the serratures. *Flowers* greenish white tinged, with red, on short petioles. *Berries* dark blue, glaucous, very sweet, ripening a little later than those of No. 5.

9. V. LIGUSTRINUM, Michx. *Privet Whortleberry.*

Branches angular, erect, slender; *leaves* sub-sessile, erect, thick, lanceolate, mucronate, serrulate, pubescent; *fascicles* sessile, with short glomerate pedicels; *corolla* ovoid-oblong.

Dry woods and mountains. May—June. A small shrub, with straight and slender branches. *Flowers* purplish-red. *Berries* black. Very variable in the shape and size of the leaves.

2. OXYCOCCUS, Pers.

Gr. *oxys*, acid, and *coccus*, a berry.

CALYX superior, 4-cleft. COROLLA 4-parted, with elongated, revolute divisions. STAMENS 8, convergent. ANTHERS tubular 2-parted, opening by oblique pores. OVARY 4-celled, many-seeded.—*Slender trailing shrubs, with alternate evergreen leaves, with revolute margins, and red acid berries.*

1. O. MACROCARPUS, Pers. *Common Cranberry.*

Stems elongated, creeping, the flowering branches ascending; *leaves* oblong, obtuse, glaucous underneath; *peduncles* lateral, from the base of the young shoots.

Peat bogs, common. June. *Stem* creeping, and throwing up short erect branches. *Leaves* about ½ inch long, and nearly ¼ wide, rounded at each end, on very short petioles, obscurely serrulate. *Flowers* flesh-colored on slender petioles ½ to 1 inch long, solitary in the axils of the upper leaves, the 4 segments reflexed. *Berry* large, scarlet or purplish, ripe in October. Highly prized for its fine acid fruit.

SUB-ORDER 2. ERICINEÆ. THE PROPER HEATH FAMILY.

OVARY free from the calyx. SEED-COAT close and thin, rarely loose and cellular.—*Shrubs or small trees.*

TRIBE 2. ANDROMEDEÆ. *Fruit a capsule opening loculicidally.*

* *Calyx becoming berry-like in fruit and enclosing the capsule*

3. GAULTHERIA, Kalm.

Dedicated by Kalm to "Dr. Gaulthier," of Quebec.

CALYX cylindrical-ovoid, 5-toothed. COROLLA ovoid-tubular, limb with 5 small revolute lobes. STAMENS 10, included. CAPSULE depressed, 5-lobed, 5-celled, 5-valved, many-seeded, inclosed when ripe by the calyx which thickens, becoming fleshy, so as to appear like a globular red berry,—

Somewhat shrubby plants, with alternate evergreen leaves, and axillary, nearly white flowers, on pedicels which are 2-bracted.

1. G. PROCUMBENS, L. *Creeping Wintergreen. Boxberry. Checkerberry.*

Stem somewhat creeping, with ascending flowering branches; *leaves* obovate or oval, obscurely serrate, shining; *flowers* mostly single in the axils, drooping.

Cold damp woods and mountain sides, common. May—July. *Stems* slender, 3 to 5 inches high, extensively creeping on or below the surface, the flowering branches ascending, simple, leafy at the summit. *Leaves* thick, acute at each end. *Corolla* white, contracted at the mouth. *Fruit* having the appearance of a bright scarlet berry. The leaves and fruit have the well-known spicy aromatic flavor of the Sweet Birch.

** *Calyx dry and unchanged in fruit.*

4. EPIGEA, Linn. GROUND LAUREL.

Gr. *epi*, upon, *ge*, the earth.

CALYX deeply 5 parted, with 3 bracts at the base. COROLLA salver-form, with a long tube, villous within; limb 5-parted spreading. STAMENS 10, with thread-like filaments. ANTHERS oblong, awnless, opening lengthwise. CAPSULE 5-celled, 5-valved, many-seeded.—*Trailing scarcely shrubby plants, bristly with rusty hairs, evergreen alternate leaves, and pale rose-colored fragrant flowers in axillary clusters.*

1. E. REPENS, L. *Trailing Arbutis.*

Stem prostrate, creeping; *leaves* roundish-oval and heart-shaped, on slender petioles; *tube* of the corolla hairy inside.

Damp woods and north side of mountains, common. April, May. A small trailing evergreen, covered with a hairy pubescence in all its parts, 10 to 15 inches long. *Leaves* 2 inches long, and 1 to 1¼ wide, roundish at the end, abruptly tipped with a very short point. *Flowers* very fragrant, white or tinged with various shades of red, in small clusters on short stalks.

5. ANDROMEDA, Linn.

Named for *Andromeda* of ancient fable.

CALYX small, various in form 5-(rarely 4)-parted, persistent. COROLLA ovoid-cylindrical, the *limb* 5-cleft, reflexed. STAMENS 10, rarely 8, included. CAPSULE 5-celled, 5-valved, many-seeded.—*Shrubs prostrate or erect, with evergreen or deciduous alternate leaves, and mostly racemed or clustered flowers.*

SEC. 1. ANDROMEDA *proper. Calyx without bracts. Anthers 2-awned. Leaves evergreen.*

1. A. POLIFOLIA, L. *Marsh Andromeda. Wild Rosemary. Rosemary Andromeda.*

Erect, very smooth; *leaves* thick, lanceolate or linear, entire, with strongly revolute margins, green above, white beneath; *flowers* on short naked peduncles crowded in a terminal umbel; *corolla* globose urn-shaped, much contracted at the top; *filaments* bearded.

Sides of ponds, and in swamps. May. A beautiful evergreen shrub 1 to 2 feet high. *Leaves* very smooth, 2 to 3 inches long, and less than ½ inch wide, on very short petioles. *Flowers* in pendulous clusters. *Calyx* white, tipped with red. *Corolla* rose-colored.

SEC. 2. LYONIA, *Nutt. Corolla sub-globose; capsule with* 5 *supernumerary valves. Shrubs with deciduous leaves.*

2. A. LIGUSTRINA. Muhl. *Privet Andromeda.*

Pubescent; *leaves* obovate-oblong, pointed nearly entire, finely serrulate; *flowers* in racemes, crowded in a somewhat leafy or naked panicle on terminal branches of the preceding year; *calyx* without bracts; *capsule* globular.

Swamps. June. A deciduous shrub 4 to 8 feet high, minutely downy when young, sometimes rusty. *Leaves* abruptly acuminate, paler beneath, 2 to 3 inches long, and nearly half as wide, on short petioles. *Flowers* small, nearly globose, white in dense panicles.

SEC. 3. CASSANDRA, *Don. Calyx with* 5 *acute sepals and* 2 *bractlets capsule-valves double. Shrubs with evergreen leaves.*

3. A. CALYCULATA, L. *Box-leaved Andromeda.*

Erect; *leaves* oval-oblong, obtuse, sub-revolute, nearly entire, rusty dotted; *bracts* ovate; *racemes* one-sided, leafy, terminal; *corolla* cylindrical-oblong, the mouth slightly narrowed and 5-toothed; *filaments* smooth.

Swamps and marshy places, common. April—May. *Shrub* 1 to 3 feet high. *Leaves* coriaceous, shining, dotted, about 1 inch long and ½ wide, those of the racemes not half as large. *Flowers* numerous, 20 to 30 in each raceme, white, each from the axil of a small leaf.

SEC. 4. EUBOTRYS, *Nutt. Calyx with* 2 *bractlets; capsule depressed-globular. Shrubs with deciduous leaves.*

4. A. RACEMOSA, L. *Racemed Andromeda.*

Nearly smooth; *leaves* oval lanceolate or oblong, acute, serrulate; *racemes* erect or spreading; *sepals* ovate-lanceolate; *corolla* cylindrical; *anthers* 4-awned at the summit.

Swamps and wet woods. June—July. A branching shrub 3 to 5 feet high. *Leaves* 1 to 2 inches long, ⅓ as wide, minutely notched, veiny, thin. *Flowers* numerous, white, closely set in a simple one-sided spiked raceme, 2 to 6 inches long. *Bracts* awl-shaped. *Corolla* 4 to 5 times as long as the calyx.

SEC. 5. MARIA, *DC. Calyx without bractlets; anthers awnless; capsule-valves simple. Shrubs with deciduous leaves.*

5. A. MARIANA, L. *Maryland Andromeda.*

Nearly smooth; leaves thickish, oval or oblong, entire, paler beneath; *flowering branches* nearly naked; *calyx* leafy; *corolla* ovoid-cylindrical; *filaments* hairy.

Sandy woods. June. *Shrub* 2 to 4 feet high, with very smooth leaves on short petioles. *Flowers* large, nearly ½ inch in diameter, white or pale red, arranged in umbel-like clusters crowded on leafless branches, from buds developed in the axils of the deciduous leaves of the preceding year.

SEC. 6. OXYDENDRON, *DC. Calyx without bractlets, acuminate; capsule pyramidal, pentangular. Trees with large, acid deciduous leaves.*

6. A. ARBOREA. L. *Sorrel-tree. Sour-wood.*

Arborescent; *leaves* oblong-lanceolate, pointed, petiolate, shining above; *corolla* oblong-ovoid, narrowed at the summit, 5-toothed; *filaments* thickened; *capsule* 5-angled.

Rich woods, rare. June—July. A fine tree, 20 to 60 feet high, trunk 10 to 15 inches in diameter, with thick and deeply furrowed bark. *Leaves* 5 to 6 inches long, and 2 to 3 wide, turning bright scarlet early in autumn. *Flowers* white, arranged in slender, somewhat 1-sided racemes crowded in a large terminal panicle. *Bracts* minute, deciduous.

6. CLETHRA, Linn. SWEET PEPPER BUSH.

Klethra, the ancient Greek name of the Alder.

CALYX 5-parted, persistent. COROLLA of 5 distinct obovate-oblong petals. STAMENS 10, exserted. ANTHERS inversely arrow-shaped. FILAMENTS subulate. STYLE slender. STIGMAS 3. CAPSULE 3-celled, 3-valved, many-seeded, enclosed by the calyx.—*Shrubs, with alternate deciduous leaves, and white flowers in single or panicled racemes.*

1. C. ALNIFOLIA, L. *Sweet Pepper Bush. White Alder.*

Leaves wedge-obovate, serrate, entire towards the base, smooth, green on both sides; *raceme* upright, hoary; *bracts* as long as the pedicels; *filaments* smooth.

Wet woods and swamps. July—Aug. *Shrub* 4 to 12 feet high. *Leaves* 2 to 3 inches long, ½ as wide above, with a long, wedge-shaped base, tapering into a short petiole, slightly pubescent beneath. *Flowers* white, fragrant, in racemes, 3 to 5 inches long; *Corolla* spreading, about equaling the stamens and styles.

7. MENZIESIA, Smith.

In honor of *Archibald Menzias*, companion of Vancouver in his voyage around the world.

CALYX bell-shaped, deeply 4-cleft. COROLLA globose, 4-cleft. STAMENS 8, included. FILAMENTS subulate, smooth. STIGMA obtuse. CAPSULE 4-celled, 4-valved.—*Heath-like shrubs, with evergreen leaves, and mostly solitary flowers.*

1. M. GLOBULARIS, Salisb. *Globose Menziesia.*

Branches and *pedicels* somewhat hairy; *leaves* oval-lanceolate, ciliate, pubescent except on the veins beneath, with a sharp glandular point.

Mountains. June. *Shrub* 4 feet high. *Leaves* very hairy when young. *Flowers* yellowish-brown, nodding, and mostly solitary on each terminal pedicel.

TRIBE 3. RHODORÆ. *Fruit a capsule opening septicidally.*

8. RHODORA, Duhamel.

Gr. *rodon*, a rose, from the color of the showy flowers.

CALYX minute, 5-toothed, persistent. COROLLA irregular and 2-lipped; the upper lip 3-lobed or 3-cleft, the lower 2-parted or of 2 distinct spreading petals. STAMENS 10, declinate. FILAMENTS unequal. CAPSULE 5-celled, 5-valved, many-seeded, opening at the top.—*A shrub with deciduous alternate leaves, and pale purple flowers.*

1. R. Canadensis, L. *Rhodora.*

Leaves alternate, oval, veiny entire, nearly smooth above, downy beneath; *flowers* clustered on short peduncles.

Mountain bogs. April—May. *Shrub* 2 to 3 feet high, with erect branches; the stems clothed with a smooth brown bark, each dividing at top into several erect, flowering branches. *Flowers* purple, in terminal clusters of 2 to 5, somewhat preceding the leaves.

9. AZALEA, Linn.

Gr. *azaleos*, arid, inappropriate as applied to our species, which mostly grow in wet places.

Calyx 5-parted, often minute. Corolla funnel-form, 5-lobed, slightly irregular; the lobes spreading. Stamens 5, with long exserted filaments, usually declined, as well as the long style. Anthers short, opening by terminal pores, pointless. Capsule 5-celled, 5-valved, many-seeded.—*Upright shrubs, with alternate deciduous leaves, and large and showy flowers, in umbelled clusters, from large scaly-imbricated buds.*

* *Flowers appearing after the leaves.*

1. A. arborescens, Linn. *Tree Azalea.*

Branchlets smooth; *leaves* obovate, obtuse, very smooth on both sides, shining above, glaucous beneath, the margins ciliate, flowers in leafy corymbs, not viscid, tube longer than the segments; *stamens* and *style* very much exserted.

Blue Mountains. June. *Shrub* 3 to 10 feet high, with thickish leaves. *Flowers* large, rose-colored, fragrant. *Scales* of the flower-buds large, yellowish-brown with a fringed white border.

2. A. viscosa, L. *Clammy Azalea. White Honeysuckle. Clammy Swamp Pink.*

Branchlets bristly; *leaves* obovate and oblong-lanceolate; *corolla* viscid, hairy; *calyx-lobes* minute.

Woods, common. June—July. *Shrub* 4 to 6 feet high, much branched above, the branches hispid. *Leaves* 1 to 2 inches long and about ½ as wide, smoothish, hispid, ciliate on the petiole, midvein and margin. *Flowers* white or tinged with rose-color, fragrant, in large clusters.

** *Flowers appearing before or with the leaves.*

3. A. nudiflora, L. *Purple Azalea. Pinxter-flower.*

Branchlets rather hairy; *leaves* obovate or oblong, downy underneath; *calyx* short; *tube of the corolla* longer than the lobes; *stamens* and *style* much exserted.

Woods and mountains, common. *Shrub* 2 to 6 feet high, much branched above. *Leaves* crowded at the ends of the branches, 2 to 3 inches long, 1 to 1½ broad, with ciliate margins. *Flowers* pale pink or purple, in terminal clusters, appearing a little before the leaves. *Stamens* purple, declinate, twice as long as the corolla. *Style* much longer than the stamens. There are numerous varieties, some with 10 or more stamens.

4. A. calendulacea, Michx. *Flame-colored Azalea.*

Branchlets somewhat hairy; *leaves* obovate or oblong, mucronate, pubescent on both sides, ciliate on the margin; *flowers* large in rather naked corymbs, not visced; *calyx-lobes* oblong, conspicuous; *stamens* and *style* much exserted.

Woods and mountains, southern parts of the State. May. A splendid flowering shrub 3 to 10 feet high, covered about the time that the leaves appear with a profusion of large and showy yellow or orange flowers, usually turning to flame-color. *Corolla* about 2½ inches long and 2 wide. Cultivation has produced many varieties, from golden yellow to dark crimson, single and double.

5. A. HISPIDUM, Torr. *Hisped Azalea.*

Branches straight, very hisped; *leaves* lanceolate, acuminate at each end, hisped above, smooth beneath, glaucous on both sides, ciliate on the margin; *flowers* very visced, appearing with the leaves; *calyx-teeth* oblong, rounded; *stamens* and *styles* exserted.

Margin of lakes, on high mountains. July, Aug. *Shrub* of a bluish appearance, 10 to 15 feet high, very upright. *Flowers* white, with a red border; the tube reddish-white. *Stamens* often 10. Professor Gray considers this scarcely distinct from *A. viscosa*.

10. RHODODENDRON, Linn. ROSEBAY.

Rhododendron, rose-tree; the ancient Greek name.

CALYX 5-parted, mostly small. COROLLA somewhat bell-shaped, or partly funnel-form, sometimes slightly irregular, 5-lobed. STAMENS 10, very rarely fewer, commonly declined. ANTHERS opening by 2 terminal pores. CAPSULE 5-celled, 5-valved, many-seeded —*Shrubs or low trees, with evergreen entire alternate leaves, and large showy flowers in compact terminal corymbs or clusters from large scaly-bracted buds.*

1. R. MAXIMUM. L. *American Rosebay.*

Leaves elliptical-oblong or lance-oblong, acute, narrowed towards the base, very smooth, paler beneath, thick and evergreen; *corolla* companulate.

Shaded ravines and water-courses, common. July. *Shrub* 6 to 20 feet high, with crooked stems. *Leaves* when young downy, becoming very smooth when full grown, 4 to 10 inches long, thick and leathery, remaining on the stem 2 or 3 years. *Corymbs* 15 to 20-flowered. *Corolla* 1 to 2 inches broad, pale rose-color or nearly white, greenish in the throat on the upper side and spotted with yellow or reddish

11. KALMIA, Linn. AMERICAN LAUREL.

Dedicated to *Peter Kalm*, a pupil of Linnæus.

CALYX 5-parted. COROLLA between rotate and companulate, 5-lobed, furnished with 10 depressions in which the 10 anthers are severally lodged until they begin to shed their pollen. FILAMENTS elastic, thread-form. CAPSULE globose, 5-celled, many-seeded.—*North American evergreen shrubs, with naked flower-buds, alternate coriacious leaves, bracted pedicels and showy white and red flowers in umbel-like corymbs.*

1. K. LATIFOLIA, L. *Mountain Laurel. Calico-bush.*

Branches terete; *leaves* mostly alternate, on long petioles, ovate-lanceolate or elliptical, tapering at each end, bright-green on both sides; *corymbs* terminal, many-flowered, clammy-pubescent.

Hills and mountains, damp soil, common. June, July. A beautiful shrub 4 to 5 feet high, with irregular branches. *Leaves* 2 to 3 inches long, thick, smooth and shining. *Flowers* very showy, in spreading corymbs, profuse light or deep rose-color. *Corolla* ¾ to 1 inch in diameter, with a short tube. *Leaves* poisonous to some animals.

2. K. ANGUSTIFOLIA, L. *Sheep Laurel.*

Branches terete; *leaves* mostly opposite or in threes, petiolate, narrowly-oblong, obtuse, pale or whitish underneath, light-green above; *corymbs* lateral, slightly glandular, many-flowered; *bracts* linear-lanceolate.

Sandy woods and hillsides, common. June, July. A beautiful shrub 2 to 3 feet high, upright. *Leaves* acutely and narrowly elliptic, with rounded ends. 1 to 2 inches long and ⅓ as wide, on short petioles. *Flowers* crimson and purple, in lateral corymbs, forming a kind of whorled fascicle around the stem. *Corolla* ½ to ¾ inch in diameter.

3. K. GLAUCA, Ait. *Swamp Laurel.*

Branchlets 2-edged; *leaves* opposite, nearly sessile, oblong or lanceolate, white-glaucous underneath, with revolute margins; *corymbs* terminal, few-flowered, smooth; *bracts* large. Var. *rosmarinifolia,* Pursh. *Leaves* linear, conspicuously revolute, nearly green beneath.

Cold peat bogs and mountains, common- June, July. A delicate straggling shrub, about 1 foot high, the branches distinctly 2-edged. *Leaves* smooth and shining, about 1 inch long. *Flowers* pale rose-color, 8 to 10 in each corymb. *Corolla* ½ inch in diameter. *Calyx* red. *Bracts* 2, concave, obtuse,

12. LEDUM, Linn. LABRADOR TEA.

Ledon, the ancient Greek name of the Cistus, transfered by Linnæus to this genus.

CALYX 5-toothed, very small. COROLLA 5-petaled, spreading. STAMENS 5 to 10, exserted. ANTHERS opening by 2 terminal pores. CAPSULE 5-celled, 5-valved, many-seeded, splitting from the base upwards.—*Low evergreen shrubs, with alternate entire leaves clothed with rusty wool underneath, and handsome white flowers in terminal umbel-like clusters from large scaly-bracted buds.*

1. L. LATIFOLIUM, Ait. *Broad-leaved Labrador Tea.*

Leaves elliptical or oblong, revolute on the margin, ferruginous-tomentose beneath; *stamens* 5, sometimes 6 or 7, as long as the corolla; *capsule* oblong.

Cold bogs and damp mountain woods. June. *Shrub* 2 to 5 feet high, with irregular woolly branches. *Leaves* 1 to 2 inches long, broad-oblong, obtuse. *Flowers* in terminal corymbs, white.

2. L. PALUSTRE, L. *Narrow-leaved Labrador Tea.*

Leaves linear, revolute on the margin, ferruginous-tomentose beneath; *stamens* 10, longer than the corolla.

Swamps. June. A shrub smaller than the last and with narrower leaves Both species have been used as substitutes for tea, but the latter is considered the best.

SUB-ORDER 3. PYROLEÆ. THE PYROLA FAMILY.

OVARY free from the calyx. PETALS nearly distinct, FRUIT a capsule.—*Mostly herbaceous plants, with evergreen foliage.*

13. PYROLA, Linn. FALSE WINTERGREEN.

A diminutive of the Latin *pyrus*, a pear, from the resemblance of the leaves of some species.

CALYX minute, 5-parted, persistent. PETALS 5, concave, deciduous. STAMENS 10, with awl-shaped, naked filaments. STYLE long and generally turned to one side. STIGMAS 5. CAPSULE depressed-globose, 5-valved from the base upwards, many-seeded.—*Low and smooth perennial herbs, bearing a cluster of rounded and petioled evergreen root-leaves, and a simple raceme of nodding flowers on an upright scaly bracted scape.*

1. P. ROTUNDIFOLIA, L. *Round-leaved Wintergreen.*

Leaves orbicular, thick, entire or crenulate, usually shorter than the dilated petioles; *raceme* elongated, many-flowered; *calyx-lobes* lanceolate, acutish; *stigma* clavate.

Damp or sandy woods, common. July. *Scape* 6 to 12 inches high, many-bracted. *Leaves* all radical, 1½ to 2 inches in diameter, on petioles about the same length. *Flowers* ¾ inch broad, nodding, white, fragrant, 8 to 20 in a raceme.

2. P. ELLIPTICA, Nutt. *Shin-Leaf.*

Leaves elliptical or obovate-oval, usually longer than the margined petiole; *raceme* many-flowered, naked or with a subulate bract; *calyx-lobes* ovate, acute; *stigma* clavate, 5-lobed.

Rich woods, common. June, July. *Leaves* all radical, membranaceous, finely serrate, with an attenuated base much longer than the petiole. *Scape* 6 to 10 inches high, slender, bearing 8 to 12 greenish-white fragrant flowers.

3. P. CHLORANTHA, Swartz. *Small Pyrola.*

Leaves small, roundish, retuse, thick, shorter than the petiole; *scape* few-flowered, nearly naked; *calyx-lobes* very short, obtuse; *petals* elliptical, converging; *stigma* with the disk 5-lobed.

Open woods, common. June. *Leaves* about 1 inch long, varying from orbicular to broad-ovate, crenulate, smooth, leathery, shining. *Scape* 6 to 8 inches high, 3 to 8-flowered. *Flowers* nodding, greenish-white, fragrant, on pedicels ½ inch long, each in the axil of a very short bract.

4. P. SECUNDA, L. *One-sided Pyrola.*

Leaves ovate, acute, thin, serrate, longer than the narrow petiole; *raceme* dense, many-flowered, secund; *calyx-lobes* ovate, shorter than the oblong petals; *style* exserted; *stigma* depresssd, 5-lobed.

Rich woods, common. July. *Leaves* somewhat raised on a decumbent stem, about 1 inch long, and petioles about the same length. *Scape* 3 to 6 inches high, with the flowers all turned to one side. *Flowers* greenish-white.

5. P. MINOR, L. *Lesser Pyrola.*

Leaves roundish, slightly crenulate, mostly longer than the margined petioles; *raceme* spiked; *bracts* as long as the pedicels; *calyx-lobes* very short; *corolla* globose; *style* included; *stigma* 5-lobed.

Base of mountains, rare. July. *Leaves* on short petioles, mucronate at the apex. *Scape* angular, 5 to 10 inches high. *Flowers* small, white or rose-color.

14. CHIMAPHILA, Pursh. Pipsissewa.

Gr. *keima*, winter, and *phileo*, to love.

Calyx 5-parted, Petals 5, spreading, concave. Stamens 19. Filaments dilated in the middle. Style very short, inversely conical, nearly immersed in the depressed summit of the globular ovary. Stigma broad and orbicular, the border obtusely 5-toothed. Capsule 5-celled, opening from the summit. Seeds numerous.—*Low perennial, nearly herbaceous plants, with running underground shoots, evergreen thick shining opposite or whorled leaves, and fragrant white or purplish flowers corymbed or umbelled on a terminal peduncle.*

1. C. umbellata, Nutt. *Prince's Pine. Pipsissewa.*

Leaves wedge-lanceolate, sharply serrate, acute at the base, in 4s or 6s; *peduncles* 4 to 7 flowered, corymbed; *bracts* linear-subulate; *style* immersed in the ovary.

A beautiful evergreen, common, in dry woods. June. *Plant* 4 to 8 inches high, leafy. *Leaves* in 2 or more irregular whorls, 2 to 3 inches long, ½ to ¾ wide, remotely and distinctly serrate, on short petioles, shining of a uniform dark green color. *Flowers* light purple on nodding petioles.

2. C. maculata, Pursh. *Spotted Wintergreen.*

Leaves ovate-lanceolate, rounded at base, remotely toothed, discolored, opposite or in threes; *peduncles* corymbose, 1 to 5-flowered; *filaments* wooly.

Dry woods. June, July. A pretty evergreen 4 to 6 inches high, with leaves 1 to 2 inches long, ⅓ as wide, marked with a whitish line along the midvein and veinlets. *Flowers* purplish-white, on nodding pedicels.

Sub-order 4. MONOTROPEÆ. Indian Pipe Family.

Ovary free from the calyx.—*Leafless herbs, destitute of green.*

5. PTEROSPORA, Nutt. Pine-drops.

Gr. *pteron*, a wing, and *spora*, seed; alluding to the singular wing borne by the seeds.

Calyx 5-parted. Corolla ovate, urn-shaped, 5-toothed, persistent. Stamens 10; anthers 2-celled, peltate. Style short; stigma 5-lobed. Capsule globose, depressed, 5-lobed, 5-celled, 5-valved. Seeds very numerous, minute, with the apex expanded into a broad reticulated wing.—*A stout and simple purplish-brown clammy pubescent perennial plant, with lanceolate scales in place of leaves scattered along the stem, and whitish flowers in a raceme.*

1. P. Andromeda, Nutt. *Tall Bird's Nest.*

Hard clayey and limestone soils; rare. July. *Plant* covered with brownish viscid hairs. *Stem* 8 to 24 inches high, straight, simple, grooved, brownish-red or purplish, clothed at the base with imbricated scales. *Flowers* very numerous, 20 to 60 in a long terminal raceme, rose-red and white.

16. HYPOPITYS, Dill. PINE-SAP.

Gr. *hypo*, under, and *pitus*, Pine-tree; from the place of its growth.

SEPALS 4 to 5-colored. PETALS 4 to 5, fleshy, with a sac-like necteriferous depression at the base. STAMENS 8 or 10; ANTHERS kidney-shaped; FILAMENTS subulate, persistent. STYLE columner, hollow; STIGMA disk-like, with a bearded margin. CAPSULE ovoid or globose, 8 to 10-grooved, 4 to 5-celled, many-seeded.—*Parasitic tawny white herbs, with scaly roots, simple stems, scales instead of leaves, and bracted racemes of flowers, at first nodding, but in fruit erect.*

1. H. LANUGINOSA, Nutt. *Pine-sap. False Beech-drops.*

Plant clothed with a velvet-like pubescence; *pedicels* much longer than the flower; *capsule* globose.

Oak and pine woods. *Plant* 4 to 6 inches high in flower, and sometimes 12 inches in fruit, tawny-white. *Flowers* 7 to 12 in a terminal raceme, the terminal with 5 petals and 10 stamens, the other with 4 petals and 8 stamens. The whole plant turns black in drying.

17. MONOTROPA, Gron. INDIAN PIPE.

Gr. *monos*, one, and *tropos*, turn; the solitary flower turned to one side.

CALYX represented by 2 to 4 scale-like deciduous bracts. COROLLA 4 to 5-petaled, persistent, gibbous at the base STAMENS 10; FILAMENTS persistent, alternating with 10 reflexed appendages of the torus; ANTHERS short. STIGMA 5-crenate. CAPSULE 5-celled, many-seeded.—*A singular white fleshy parasitic herb, rising in a cluster from a matted mass of fibrous roots, with scales like the petals instead of leaves, bearing a solitary flower turned to one side.*

1. M. UNIFLORA, L. *Indian Pipe. Bird's Nest.*

Stem short; *scales* approximate; *flowers* nodding; *fruit* erect; *stamens* 10.

Deep rich woods; common. June—Aug. A small succulent plant from 4 to 6 inches high, white and smooth, becoming purplish-black in drying.

ORDER 62. **AQUIFOLIACEÆ.**—*Holly Family.*

Trees or shrubs with alternate or opposite leaves, without stipules, and small axillary 4 to 6-merous white or greenish flowers. CALYX 4 to 5-sepaled, imbricate in æstivation. COROLLA regular, 4 to 6 parted or cleft, hypogynous. STAMENS inserted into the tube of the corolla and alternate with its segments: ANTHERS adnate, opening lengthwise. STIGMAS 4 to 6 or united into one, nearly sessile. OVARY free from the calyx 4 to 6-celled. FRUIT a berry-like drupe, with 2 to 6 stones or nucules: SEED suspended, with a minute embryo in fleshy albumen.

1. ILEX, Linn. HOLLY.

CALYX 4 to 5-toothed, persistent. COROLLA subrotate, 4 to 5-parted. STAMENS 4 to 5. STIGMAS 4 to 5, subsessile, united or distinct. BERRY 4 to 5-seeded.—*Shrubs or trees, with alternate spinose dentate leaves, and whitish, mostly perfect flowers.*

SEC. 1. AQUIFOLIUM, Tourn. *Leaves evergreen, spiny-toothed.*

1. I. OPACA, Ait. *American Holly.*

Leaves oval, flat, acute, smooth, margins wavy, armed with scattered spiny teeth; *flowers* in loose clusters along the base of the young branches and from the axils; *calyx*-teeth acute.

Moist woodlands, rare. June. An evergreen tree 10 to 15 feet high. *Leaves* tough and shining, with rigid spines. *Flowers* small, white, in scattered clusters, the fertile ones succeeded by red berries which remain until late in autumn. The wood is fine grained and compact, and is employed by cabinet makers and turners.

SEC. 2. PRINOIDES.—*Leaves membranaceous, deciduous.*

2. I. MONTANA, Torr. & Gr. *Mountain Holly.*

Leaves oblong-ovate or oval-lanceolate, pointed, sharply serrate, smooth, closely approximated on the ends of the branches; *fertile flowers* on very short peduncles; *calyx-teeth* obtuse.

Damp woods, along the Alleghanies. June. *Shrub* or small tree 6 to 20 feet high, straggling. *Leaves* 3 to 5 inches long, very thin. *Fertile flowers* perfect, on short stalks. *Sterile flowers*, if any, unknown. *Nutlets* strongly striate-ribbed on the back.

2. PRINOS, Linn. WINTERBERRY.

The Greek name of the Holly.

FLOWERS mostly diœcious or polygamous. CALYX minute, 4 to 6-toothed. COROLLA somewhat rotate, usually 6-parted. STAMENS mostly 6. OVARY superior, 4 to 6-celled. FRUIT a drupe, with 6 smooth nutlets.—*Shrubs with alternate leaves, and inconspicuous flowers.*

* *Leaves deciduous; fruit bright red.*

1. P. VERTICELLATUS, L. *Black Alder. Winterberry.*

Leaves oval, obovate, or wedge-lanceolate, pointed, acute at the base, sharply serrate, downy on the veins beneath; *sterile flowers* axillary, subumbellate; *fertile flowers* somewhat clustered or solitary; *berry* 6-celled, 6-seeded.

Swamps, common. June, July. *Shrub* 3 to 10 feet high, very variable in foliage, often rugose veiny. *Flowers* numerous, small, white. *Fruit* globose, bright scarlet, crowded so as to appear in whorls on the branches, and remaining until late in autumn.

2. P. LÆVIGATUS, Pursh. *Smooth Winterberry.*

Leaves lanceolate, pointed at both ends, minutely serrate with appressed hairs, shining above, minutely pubescent on the veins beneath; *sterile flowers* 2 to 5 in a cluster, or single on slender peduncles; the *fertile* mostly single, and on short peduncles.

Swamps, along cold streams and mountains. June. *Shrub* 4 to 8 feet high, with grayish and warty branches. *Leaves* 1 to 2 inches long, ½ to 1 inch wide, on petioles ¼ to 1 inch long. *Flowers* mostly solitary, the sterile on pedicels near 1 inch long, the fertile scarcely ¼ as long. *Berries* large red.

** *Leaves coriaceous, evergreen, shining above; fruit black.*

3. P. GLABER, L. *Ink-berry. Evergreen Winterberry.*

Leaves wedge-lanceolate or oblong, somewhat toothed towards the apex, smooth; *pedicels* axillary, of the fertile 1-flowered, the sterile 3 to 6-flowered at the summit.

Sandy woods. July. *Shrub* 3 to 4 feet high; much branched. *Leaves* crowded, about 1½ inch long, broadest above the middle. *Flowers* white mostly 6-parted. *Berries* globose, black and shining.

3. NEMOPANTHES, Raf. MOUNTAIN HOLLY.

Gr. *nema*, a thread, *pous*, a foot, and *anthos*, a flower; a flower with a filiform peduncle.

FLOWERS polygamo-diœcious. CALYX a minute ring. PETALS 5, oblong-linear, reflexed, distinct. STAMENS 5. OVARY hemispherical; STIGMAS 3 to 4, sessile. FRUIT a 3 to 4-celled globose berry, with 4 to 5 long nutlets.—*A shrub with alternate entire deciduous leaves, on short petioles, and solitary flowers on long and slender axillary peduncles.*

1. N. CANADENSIS, DC. *Canadian Holly.*

Leaves oval, very entire, smooth, mucronate-pointed; *peduncles* nearly solitary, very long; *fruit* somewhat 4-sided.

Damp cold woods. May, June. *Shrub* 4 to 6 feet high, with smooth ash-gray bark. *Leaves* about 2 inches long on petioles ½ as long. *Flowers* small, greenish-white. *Berries* dry, red.

ORDER 63. **EBENACEÆ.**—*The Ebony Family.*

Trees or shrubs, with alternate entire leaves, and polygamous regular flowers which have a calyx free from the ovary, the stamens 2 to 4 times as many as the lobes of the corolla, and the fruit a several-celled berry. SEEDS anatropous, mostly single in each cell, large and flat, with a smooth coriaceous integument; EMBRYO shorter than the hard albumen.

1. DIOSPYRUS, Linn. PERSIMMON.

Gr. *Dios, pyrus* the fruit of Jove.

Diœcious. CALYX 4 to 6-cleft. COROLLA 4 to 6-lobed. STAMENS mostly 16 in the sterile flowers, and 8 in the fertile, in the latter imperfect; FILAMENTS shorter than the anthers. BERRY large ovoid or globular, surrounded at the base by the permanent calyx, 4 to 8-celled, 4 to 8-seeded.—*A large genus of shrubs or trees, mostly tropical, with alternate entire leaves and axillary flowers, the fertile axillary and solitary, the sterile smaller and often clustered.*

1. D. VIRGINIANA, L. *Common Persimmon.*

Leaves ovate-oblong, nearly smooth, entire; *peduncles* very short; *calyx* 4-parted;

corolla somewhat bell-shaped; *stamens* 8; *styles* 4, 2-lobed at the apex.

Woods and old fields, abundant near Liverpool, along the Suspuchanna. June. A small tree 20 to 30 feet high. *Leaves* 2 to 3 inches long, glaucous beneath. *Flowers* obscure, pale, yellowish-green, the fertile ones succeeded by a plum-like fruit, 1 inch in diameter, which is exceedingly astringent when green, golden-yellow when ripe, and sweet and edible after exposure to frost.

ORDER 64. PLANTAGINIACEÆ.

Chiefly stemless herbs, with regular 4-merous spiked flowers, the stamens inserted on the tube of the dry and membranaceous veinless monopetalous corolla alternate with its lobes;—chiefly represented by the typical genus

1. PLANTAGO, Linn. PLANTAIN.

The Latin name of the Plantain.

FLOWERS perfect. CALYX of 4 imbricated persistent sepals. COROLLA tubular, withering on the capsule, the border 4-parted, reflexed. STAMENS 4, mostly with long and weak filaments. CAPSULE 2-celled, 2-several-seeded, opening transversely so that the top falls off like a lid.—*Acaulescent herbs, with radical ribbed leaves, and small whitish flowers in a bracted spike raised on a naked scape.*

1. P. MAJOR, L. *Common Plantain.*

Smooth or hairy; *leaves* oval or ovate, somewhat toothed, 5 to 7-nerved, abruptly narrowed into a channelled petiole; *spike* long, cylindrical, densely flowered; *stamens* and *style* long.

Rich moist soil, about footpaths near houses. June—Sept. Per. *Scape* 8 to 12 inches high, pubescent. *Leaves* spreading on the ground, coarsely toothed. *Spike* 2 to 6 inches long, close. *Flowers* whitish. Probably introduced.

2. P. CORDATA, Lam. *Heart-leaved Plantain.*

Smooth; *leaves* ovate and mostly heart-shaped, scarcely toothed, thickish, on long stout petioles; *spike* very long, at length rather loose; *bracts* ovate, obtuse *seeds* mostly 4.

Banks of streams, rare. June, July. Per. *Scapes* stout 1 to 2 feet high. *Leaves* 3 to 8 inches long, the 6 to 8 ribs or veins confluent below with the thick midrib. *Flowers* in a slender elongated spike, with white corollas.

3, P. LANCEOLATA, L. *Lance-leaved Plantain.*

Hairy or almost smooth; *leaves* lanceolate, 3 to 5-nerved, entire or nearly so, tapering to each end, on slender petioles, remotely toothed; *scape* slender, elongated, grooved; *spike* short, ovoid or oblong-cylindrical, very dense; *bracts* scale-like, ovate, pointed; *seeds* 2.

Dry fields among grass, common. May—Aug. Per. *Scape* 12 to 18 inches high, somewhat hairy. *Flowers* whitish, with 2 of the sepals commonly united into one. Introduced.

4. P. VIRGINICA, L. *Virginian Plantain.*

Woolly with soft hairs; *leaves* oblong or lanceolate-ovate, 5-nerved, sparingly toothed, or entire, narrowed into a short margined petiole; *spike* cylindrical, dense-flowered above and interrupted and scattered below; *lobes of the corolla* in fruit involute and converging into a sort of beak.

Sandy fields. April—Sept. Biennial. *Scapes* 3 to 10 inches high, angular. *Leaves* 2 to 3 inches long, obtuse. *Bracts* nearly as long as the calyx. *Flowers* yellowish, with the anthers exserted in some specimens, and included and small in others. *Seeds* oval, concave on the inner face.

5. P. PUSILLA, Nutt. *Dwarf Plantain.*

Minutely woolly; leaves linear-subulate, flat, entire, acute; *scape* terete, slender, longer than the leaves; *spike* loosely-flowered, the lower flowers distant; *bracts* ovate, acute; *stamens* short.

Dry bare soil and rocky hills. April—Aug. Annual. *Scape* 2 to 3 inches high, slender. *Leaves* crowded, about 1 inch long. *Spike* ½ to 2 inches long, the flowers interrupted.

ORDER 65. **PLUMBAGINACEÆ.**—*Leadwort Family.*

Herbaceous plants or undershrubs, with alternate or clustered leaves, somewhat sheathed at base, and regular 5-merous flowers, in loose panicles or contracted into heads. CALYX tubular, plaited, persistent. COROLLA monopetalous, or of 5 regular petals. STAMENS 5, opposite the separate petals or the lobes of the corolla. OVARY free, 1-celled, with a solitary ovule hanging from a long cord which rises from the base of the cell. FRUIT an utricle.

1. STATICE, Tourn. SEA LAVENDER.

Gr. *statike*, to stop, on account of its astringency.

CALYX funnel-form, 5-toothed. PETALS 5, united at base. STAMENS 5, inserted on the claws of the petals. STYLES 5, separate. FRUIT membraneous and indehiscent, 1-seeded, in the bottom of the calyx.—*Salt-marsh perennials, with thick and stalked radical leaves, and small flowers loosely spiked on the branches of a compound corymb, one-sided, 2-bracted.*

1. S. LIMONIUM, L. *Marsh Rosemary.*

Leaves obovate-lanceolate or oblong, tipped with a point, 1-ribbed; *scape* much branched, the flowers rather crowded along the upper side of the spreading branchlets.

Salt marshes, rare. Aug. *Scape* about a foot high, with several lanceolate, clasping bracts. *Calyx* pink, hairy along the angles. *Corolla* pale-blue. *Root* thick and woody, very astringent. Perhaps not a native of this State.

2. ARMERIA, Willd. THRIFT.

CALYX tubular, bell-shaped, 5-angled, with 5 shallow lobes, plaited. PETALS 5, almost distinct. STAMENS 5, inserted on the base of the petals. STYLES 5, distinct. FRUIT indehiscent, invested by the calyx.—*Perennials, with mostly linear radical leaves, and a simple scape, appendaged above, with the showy rose-colored flowers in a dense head.*

1. A. VULGARIS, Willd. *Thrift.*

Leaves linear, flat, obtuse; *outer bracts* of the involucre ovate, acute, shorter than the sheathing appendage at their base; *scape* terete, smooth.

Rocky places, rare. July, Aug. *Root* large, woody. *Leaves* 3 to 4 inches long, and about ¼ inch wide, numerous, crowded. *Scape* about 1 foot high, bearing a singular sheath at top. *Flowers* in heads, rose-colored, intermixed with scales. Pursh gives this as a native of this State, while Prof. Gray thinks it is not indiginous in the United States.

ORDER 66. PRIMULACEÆ.—*Primrose Family.*

Herbaceous annual or perennial plants, with regular perfect flowers, the stamens as many as the lobes of the monopetalous (rarely polypetalous) corolla and inserted opposite them on the tube. CALYX 4 to 5-cleft, persistent. STAMENS 4 to 5, rarely 6 to 8. STYLE 1; STIGMA capitate; OVARY 1-celled. CAPSULE 1-celled, with a central placentæ. SEEDS numerous.

TRIBE I. PRIMULEÆ.—*The Primrose Tribe.*

Capsule entirely free from the calyx, opening by valves.

1. PRIMULA, Linn. PRIMROSE.

Lat. *primus*, first; on account of the early appearance of the flowers of some species.

CALYX tubular, angled, 5-cleft. COROLLA salver-shaped, enlarging above the insertion of the stamens, 5-lobed; LOBES often notched or inversely heart-shaped. STAMENS 5, included. CAPSULE many-seeded, splitting at the top into 5 valves or 10 teeth.—*Low perennial herbs, with the veiny leaves in a tuft at the root, and mostly simple scapes bearing the flowers in an umbel.*

CULTIVATED EXOTIC SPECIES.

1. P. VULGARIS, Huds. *Common Primrose.*

Leaves obovate, oblong, toothed, rugose, villous beneath; *umbel* radical; *flower stalks* as long as the leaves; *corona* flat. Native of Europe. A beautiful garden plant, cultivated and highly esteemed for its early flowering, in the numerous varieties there are some with red, pink, white, orange, and purple flowers, and in some instances the umbels are on a scape. The roots and seeds smell of anise seed. April.

2. P. VERIS, Cam. *Cowslip.*

Leaves toothed, rugose, hairy beneath; *umbels* many-flowered; *flowers* all nodding; *corolla* concave. Native of Britain. *Flowers* yellow. The plant smells strongly of anise. Its varieties may be increased by raising from the seeds.

3. P. ELATIOR, Jacq. *Oxlip Primrose. Polyanthus.*

Leaves toothed, rugose, hairy on each side; *umbel* many-flowered, with the outer flowers nodding; *corolla* flat. Native of Britain. This is the *Oxlip* from which all the varieties of *polyanthuses* have been grown. The flowers are on a scape from 3 to 9 inches high, varying from yellow to red, purple and white.

2. DODECATHEON, Linn. AMERICAN COWSLIP.

Gr. *dodeka*, twelve, *theoi*, gods; alluding to its curious flowers which are about 12.

CALYX deeply 5-cleft; the divisions lanceolate, reflexed. COROLLA with a very short tube, and rotate, 5-parted limb, with reflexed long and narrow segments. STAMENS 5, inserted into the throat of the corolla; FILAMENTS short, monodelphous at the base, with long and linear approximate anthers. STYLE exserted. CAPSULE oblong-ovoid, 5-valved, many-seeded.—*Perennial smooth herbs, with fibrous roots, radical oblong or spatulate leaves, in clusters, and an erect simple scape bearing a terminal umbel of nodding flowers, purple rose-color or sometimes white.*

1. D. MEDIA, L. *American Cowslip. Mead's Cowslip.*

Leaves oblong or oval, obtuse, tapering into a margined petiole, toothed or entire; *umbel* many-flowered; *involucre bracts* ovate or lanceolate; *anthers* acute, much longer than the short filaments.

Rocky places, along the Susquehanna. May. A beautiful smooth plant, with radical clustered leaves, 5 to 10 inches long, by 1 to 2 inches wide, the margin often wavy. *Scape* 6 to 12 inches high. *Corolla* white, rose-colored or purple. *Anthers* ¼ to ½ inch long, yellow, purple at base.

2. D. INTEGRIFOLIUM, Michx. *Dwarf American Cowslip.*

Leaves ovate or lanceolate, subspatulate, obtuse, petiolate; *involucre bracts* lanceolate or linear, acute; *umbel* few-flowered; *flowers* erect.

Mountains, rare. June. A much smaller plant than the preceding. *Scape* 4 to 8 inches high, thick. *Leaves* 3 to 5 inches long, on naked petioles. *Flowers* pale-blue, somewhat crowded, on short pedicels. This may prove to be only a variety of the preceding species.

3. TRIENTALIS, Linn. STARFLOWER.

Lat. *triens*, the third part of a foot; alluding to the size of the plant.

CALYX mostly 7-parted. COROLLA mostly 7-parted, spreading, flat without any tube. STAMENS 6 to 8; FILAMENTS slender, united into a ring at base. STYLE filiform. CAPSULE globose, few-seeded.—*Low and smooth perennials, with simple erect stems, a whorl of veiny leaves at the summit, and a few white flowers on solitary peduncles.*

1. T. AMERICANA, Pursh. *Chickweed Wintergreen.*

Leaves narrow-lanceolate, serrulate, acuminate; *petals* finely pointed.

Low woods, rare. May. *Stem* 6 inches high. *Leaves* 2 to 3 inches long, 6 or 7 in a terminal whorl, with a few minute alternate ones below. *Flowers* white on terminal filiform peduncles.

4. LYSIMACHIA, Linn. LOOSESTRIFE.

Gr. *lusis*, a release, and *mache*, strife.

CALYX 5-parted. COROLLA with a very short tube;

limb 5-parted. STAMENS 5; FILAMENTS often united into a ring at base. CAPSULE globose, 5 to 10-valved, few-many-seeded.—*Perennials with entire opposite or verticellate leaves, and axillary or racemed flowers with yellow corollas.*

1. L. STRICTA, Ait. *Upright Loosestrife.*

Stem erect, smooth; *leaves* opposite, or rarely alternate, lanceolate, acute at each end, punctate; *raceme* terminal, very long, loose; *pedicels* long, slender.

Low grounds, common. July, Aug. *Stem* 1 to 2 feet high, often with bulblets in the axils, at length branched, very leafy. *Flowers*, yellow, on slender pedicels in a whorled raceme, 5 to 10 inches long, which is leafy at the base.

2. L. QUADRIFOLIA, L. *Whorled Loosestrife.*

Somewhat hairy; *stem* simple; *leaves* whorled in fours or fives (rarely 3s or 6s), ovate-lanceolate, acuminate, punctate; *flowers* on capillary peduncles from the axils of the leaves.

Moist or sandy soils, common. June, July. *Stem* 12 to 15 inches high, with many whorls of 4 to 5 leaves, each bearing a peduncle about 1 inch long in its axil, with a single flower. *Corolla* yellow, with purple lines. *Anthers* purple.

3. L. CILIATA, L. *Hairy-stalked Loosestrife.*

Leaves lanceolate-ovate, tapering to an acute point, rounded or heart-shaped at the base, on long petioles; *petioles* ciliate; *peduncles* mostly in pairs, 1-flowered; *flowers* drooping; *corolla* longer than the calyx.

Banks of streams and thickets; common. July. *Stem* 2 to 3 feet high, square, sparingly branched. *Leaves* 3 to 6 inches long, on hairy petioles ½ to 2 inches long, somewhat cordate at base, the upper ones apparently in fours. *Flowers* large, yellow, axillary. *Stamens* with 5 alternate teeth or rudimentary filaments.

4. L. LANCEOLATA, Walt. *Lance-leaved Loosestrife.*

Leaves lanceolate, acute, narrowed at the base into a short and margined petiole fringed with hairs, or the upper nearly sessile and linear, the lowest oblong and spatulate; *peduncles* axillary, mostly in pairs, 1-flowered; *corrolla* longer than the calyx.

Var. 1. *hybrida*, has the leaves varying from lanceolate to nearly oblong.

Var. 2. *heterophyla*, with the leaves narrow, linear and acute at each end

Swamps and moist grounds. July. *Stem* 12 to 20 inches high, sometimes branched at base. *Leaves* 2 inches or more long, varying from ½ to 1 inch wide. *Flowers* yellow resembling those of L. *ciliata*.

TRIBE 2. ANAGALLIDEÆ.—*The Pimpernel Tribe.*

Capsule free from the calyx, opening all round by a transverse line, the top falling off like a lid.

5. ANAGALIS, Tourn. PIMPERNEL.

Gr. *anagalao*, to laugh; on account of its supposed exhilerating virtues.

CALYX 5-parted. COROLLA wheel-shaped, with scarcely any tube, 5-parted, longer than the calyx. STAMENS 5; FILAMENTS hairy. CAPSULE globose, circumscissile, the top falling off like a lid, many-seeded.—*Small spreading procumbent herbs, with opposite or whorled entire leaves, and solitary flowers on axillary peduncles.*

1. A. ARVENSIS, L. *Common Pimpernel. Poor Man's Weather-glass.*

Leaves ovate, sessile, shorter than the peduncles; *sepals* linear-lanceolate, about as long as the petals; *petals* obovate, obtuse, fringed with minute teeth, longer than the stamens.

Waste sandy fields, introduced from Europe. June—Aug. *Stem* 6 to 20 inches long, with elongated branches, or simple. *Leaves* ½ inch long. *Flowers* opposite, small but beautiful, with scarlet, sometimes purple, blue or white petals, quickly closing at the approach of rainy weather; whence the common name of "*Poor Man's Weather-glass.*"

TRIBE 3. SAMOLEÆ.—*The Water Pimpernel Tribe.*

Capsule half adherent to the calyx.

6. SAMOLUS, Linn. WATER-PIMPERNEL.

From *Samos*, the island where the original species was first found,

CALYX 5-cleft, the tube adherent to the base of the ovary. COROLLA somewhat bell-shaped, 5-cleft, with 5 sterile filaments in the sinuses. STAMENS 5, included, on the tube of the corolla. CAPSULE 5-valved at the summit, many-seeded.—*Smooth herbs, with alternate entire leaves, and small white flowers in racemes.*

1. S. VALERANDI, L. *Brook-weed.*

Stem erect, subsimple; *leaves* ovate, obtuse, *radical ones* on long petioles, *upper* sessile; *racemes* elongated, loose, many-flowered; *pedicels* with a small bract near the middle.

Wet gravelly places. July—Sept. *Stem* 8 to 12 inches high, smooth. *Leaves* 1 inch long, broadly-lanceolate. *Flowers* small, white.

TRIBE 4. HOTTONIEÆ.—*The Featherfoil Tribe.*

Capsule opening by valves; seeds fixed by the base, anatropous.

7. HOTTONIA, Linn. FEATHERFOIL.

CALYX 5-parted, the divisions linear. COROLLA salver-form, with a short tube; the limb 5-parted. STAMENS 5, included. CAPSULE 5-valved, many-seeded. SEEDS attached by their base.—*Aquatic perennials, with pectinate immersed leaves, and white flowers whorled at the joints in a somewhat interrupted raceme borne on hollow nearly leafless peduncles.*

1. H. INFLATA, Ell. *Inflated Featherfoil.*

Leaves dissected into thread-like divisions, scattered on the floating stems, or whorled or crowded at the base of the cluster of peduncles; *peduncles* inflated between the joints; *flowers* verticellate, mostly in fours, on short pedicels.

Stagnent water, ditches and pools. June, July. *Stem* immersed, thick, round, spongy. *Peduncles* 6 to 10 together, arising in a sort of umbel from the top of the stem, 8 to 10 inches long. *Flowers* small, white in numerous verticels.

ORDER 67. **LENTIBULACEÆ.**—*Bladderwort Family.*

Small aquatic herbs, with a 2-lipped calyx, and a 2-lipped personate corolla, 2 stamens with 1-celled anthers, and a 1-celled ovary with a free central placenta, bearing anatropous seeds.—COROLLA deeply 2-lipped, spurred at the base in front; the *palate* usually bearded. OVARY free. STYLE very short or none. STIGMA 1 to 2-lipped, the lower lip longer and revolute over the approximate anthers. CAPSULE often bursting irregularly. SCAPES 1-few-flowered.

1. UTRICULARIA, Linn. BLADDERWORT.

Name from *utriculus*, a little bladder.

CALYX 2-parted, subequal, the *lips* entire or nearly so. COROLLA personate, the palate on the lower lip projecting, and often closing the throat. STAMENS 2. STIGMA bilabiate. CAPSULE globular, 1-celled.—*Immersed aquatic herbs, with axillary dissected leaves, mostly bearing little bladders, which are filled with air and float the plant at the time of flowering, and erect scapes bearing yellow or purplish flowers.*

1. U. INFLATA, Walt. *Inflated Bladderwort.*

Upper leaves in a whorl, floating; *leaf-stalks* inflated, each into an oblong bladder; *lower leaves* capillaceous, dissected; *scape* 4 to 10-flowered; *spur* conical, ½ as long as the corolla; *style* distinct.

Ponds. Aug. *Stem* very long, branching, suspended in the water by a single irregular whorl of 5 or 6 floating, inflated leaves which are oblong, cleft, and pinnatifid at the end. *Flowers* large, yellow, on a scape 8 inches long, peduncled, with sheathing bracts.

2. U. PURPUREA, Walt. *Purple Bladderwort.*

Stem long, floating, branched; *leaves* whorled along the submersed stems, petioled, decompound, capillary, bearing many bladders; *scape* assurgent, 2 to 4-flowered; *spur* appressed to the lower lip of the corolla and about ¼ as long.

Ponds. Aug., Sept. *Stem* 1 to 3 feet long. *Leaves* 1½ inches long. *Flowers* violet-purple, with a greenish spur on axillary, solitary scapes 2 to 4 inches long.

3. U. VULGARIS, L. *Common Bladderwort.*

Floating; *stem* immersed, 2-forked; *leaves* many-parted, crowded on the long stems, capillary, bearing many bladders; *flowers* 5 to 12, on scapes; upper lip of the closed corolla, scarcely longer than the prominent palate; *spur* conical incurved.

Pools and ponds of deep water; common. July, Aug. Per. Root much branched. *Immersed stems* 1 to 3 feet long. *Leaves* very numerous 1 inch long. *Flowers* ½ to ¾ inch broad, yellow, racemed on scapes 6 to 12 inches long, rising out of the water.

4. U. CORNUTI, Michx. *Horned Bladderwort.*

Stem erect, rigid, 2 to 7-flowered: *pedicels* not longer than the calyx; *upper lip* of the corolla obovate, entire; *lower lip* large and helmet-shaped; *spur* awl-shaped, turned downwards.

Peat bogs and sandy swamps. June—Aug. *Scape* 8 to 12 inches high, leafless, but furnished with a few small, distant, ovate, pale scales, and bearing at the top 2 to 3 large, deep-yellow crowded flowers.

ORDER 68. OROBANCHACEÆ.—*Broom-rape Family.*

Herbs destitute of green foliage, growing parasitically upon the roots of other plants, with didynamous flowers, a 1-celled ovary with 2 or 4 parietal placentæ and many-seeded capsules. CALYX persistent, 4 to 5-toothed or parted. COROLLA tubular, more or less 2-lipped, ringent, persistent. STAMENS 4, more or less dydanamous, inserted on the tube of the corolla: ANTHERS 2-celled. OVARY free, ovoid, pointed with a long style which is curved at the apex; STIGMA large.

1. EPIPHEGUS, Nutt. BEECH-DROPS.

Gr. *epi*, upon, *phegus* the beech; because it grows on the roots of that tree.

FLOWERS monœciously-polygamous, racemose or spiked, scattered on the branches. CALYX 5-toothed. STIGMA capitate, somewhat 2-lobed. CAPSULE 2-valved at the apex, with 2 approximate placentæ on each.—*Low perennials, with lurid yellowish or brownish scales instead of leaves, and simple branches floriforous their whole length, the upper flowers sterile, with a long tubular corolla and long filaments and style; the lower fertile, with a very short corolla, which seldom opens, but is forced off from the base by the growth of the capsule.*

1. E. VIRGINIANA. Bart. *Cancer-root.*

Whole plant purplish-brown; *stem* branched, leafless; *flowers* remote, alternate.

Common under the shade of Beech-trees, parasitic on their roots, 6 to 12 inches high, much branched, slender, with scattered inconspicuous scales. *Corolla* of the upper flowers whitish and purple, ½ inch long, curved, 4-toothed, the upper lip broadest, notched at the apex, arched. *Seeds* very numerous, shining.

2. CONOPHOLIS, Wallr. SQUAW-ROOT.

Gr. *konos*, a *fir-cone*, and *pholis*, a *scale*; the lower scales covering each other similar to those of the fir-cone.

FLOWERS in a thick scaly spike, perfect with 2-bractlets at the base of the irregular calyx. COROLLA tubular, swelled at the base, 2-lipped; the *upper lip* arched, notched at the summit, the lower short, 3-parted, spreading. STAMENS protruded. STIGMA depressed. CAPSULE with 4 placentæ, approximate in pairs on the middle of each valve.

1. C. AMERICANA, Wallroth. *American Broomrape.*

Stem simple, covered with oval-lanceolate imbricated scales; *spike* smooth, terminal; *corolla* recurved. (Orobanche Americana, L.)

Oak woods, growing in clusters among fallen leaves. May, June. A singular plant chestnut colored or yellowish throughout, 4 to 6 inches high, very smooth.

3. APHYLLON, Mitchell. NAKED BROOMRAPE.

Gr. *a*, privative, and *phullon* foliage, alluding to the naked stalks.

FLOWERS perfect, solitary on long naked scapes, without bractlets. CALYX 5-cleft, regular. COROLLA-TUBE long, curved, with a spreading border, somewhat 2-lipped; the *upper lip* deeply 2-cleft, the lobes similar to the 3 of the lower lip. STAMENS included, STIGMA broadly 2-lipped. CAPSULE with 4 equidistant placentæ, 2 borne on each valve half way between the midrib and the margin.

1. A. UNIFLORA, Torr. & Gr. *One-flowered Cancer-root.*

Stem subterranean or nearly so, very short, scaly, often branched, each branch sending up 1 to 3 slender 1-flowered scapes; *calyx-lobes* lance-awl-shaped; *corolla-lobes* obovate.

Woods. April, May. Hairy, brownish-yellow. *Corolla* 1 inch long, tinged and edged with purple, with 2 yellow bearded folds in the throat. (Orobanche uniflora, L.)

ORDER 69. **BIGNONIACEÆ.**—*Bignonia Family.*

Woody or sometimes herbaceous plants, with monopetalous didynamous flowers, a mostly 2-celled ovary and the numerous anatropous seeds with a large flat embryo and no albumen.—CALYX 2-lipped, 5-cleft, or entire. COROLLA tubular or bell-shaped, 5-lobed, somewhat irregular and 2-lipped. STAMENS 5, inserted on the corolla, 1 or 3 sterile. OVARY free, bearing a long style and a 2-lipped stigma.

SUB-ORDER I. BIGNONIEÆ. TRUE BIGNONIA FAMILY.

Fruit a 2-valved pod; seeds flat winged. Trees or woody vines.

1. TECOMA, Juss. TRUMPET-FLOWER.

Abridged from the Mexican name.

CALYX bell-shaped, 6-toothed. COROLLA funnel-form, 5-lobed, a little irregular. STAMENS 4, didynamous. CAPSULE long and narrow, 2-celled, 2-valved, the partition contrary to the valves. SEEDS in a single row in each cell.—*Trees or shrubs, often climbing, with opposite, digitate or unequally pinnate leaves and showy flowers.*

1. T. RADICANS, Juss. *Trumpet Creeper.*

Climbing by radicating tendrils; *leaves* unequally pinnate; *leaflets* 5 to 11, ovate, pointed, toothed; *flowers* in terminal corymbs; *corolla-tube* thrice longer than the calyx; *stamens* included.

A splendid climber in woods and thickets, along rivers. June—Aug. *Stem* 30 to 80 feet in length, ascending trees. *Leaves* 10 to 15 inches long; *leaflets* 2 to 3 by 1 to 2 inches. *Flowers* 1½ inch long, orange and scarlet showy.

2. T. GRANDIFLORA, Delaun. *Chinese Trumpet-flower.*

Climbing, smooth; *leaves* unequally pinnate; *leaflets* 3 to 5 pairs, ovate-acuminate, dentate-serrate; *panicle* terminal; *pedicels* nodding, biglandular; *corolla-tube* scarcely longer than the 5-cleft calyx. Native of China and Japan. *Flowers* of a rich scarlet, shorter and broader than in T. radicans.

2. CATALPA, Scop., Walt. INDIAN BEAN.

The aboriginal name.

CALYX deeply 2-lipped. COROLLA bell-shaped, swelling; the irregular border 5-lobed, spreading, wavy. STAMENS 5, but mostly only 2 of them anther-bearing. POD very long and slender, nearly cylindrical, 2-celled, the partitions contrary to the valves. SEEDS in a single row in each cell, broadly winged on each side, the wings cut into a fringe.—*Trees with simple opposite or ternate-verticellate petiolate leaves, and terminal panicles of white flowers.*

1. C. BIGNONIOIDES, Walt. *Catalpa.*

Leaves heart-shaped, membranaceous, pointed, downy beneath; *flowers* in open compound panicles; *calyx-lips* mucronate.

Native of the South, but naturalized along the Schuylkill near Philadelphia. June. A well known ornamental tree growing from 15 to 30 feet high, with a wide spreading top, and comparatively few branches. *Leaves* large, heart-shaped. *Flowers* white, slightly tinged with violet and dotted with purple and yellow in the throat. *Pod* remaining on the tree until the following spring, often 1 foot long.

SUB-ORDER II. SESAMEÆ. THE SESAMUM FAMILY.

Pod or fleshy and woody fruit falsely 4 to 5 celled; seeds wingless.

3. MARTYNIA, Linn. UNICORN PLANT.

In honor of Prof. *John Martyn* of Cambridge, Eng. 1768.

CALYX 5-cleft. COROLLA gibbous, bell-shaped, 5-lobed, irregular. STAMENS 5, one sterile, 4 didynamous. CAPSULE fleshy, and with the inner part soon becomes woody, terminated by a long beak, which at length splits into 2 hooked horns, the capsule opening at the apex between the beaks, imperfectly 5-celled. SEEDS several, wingless, with a thick and spongy roughened coat.—*Low branching annuals, clammy pubescent, exhaling a heavy odor, with opposite, petiolate, subcordate roundish leaves, and large racemed flowers.*

1. M. PROBOSCIDEA, Glox. *Crowspur.*

Leaves heart-shaped, oblique, or undulate, the upper alternate; *flowers* on long, axillary peduncles; *beaks* much longer than the capsule.

Banks of the Susquehanna, near Harrisburg. July—Sept. *Stem* 1 to 2 feet high. *Corolla* large, pale, dull-yellow, the limb nearly as broad as the leaves, tinged or spotted with yellow or purple. *Stamens* bright yellow, exserted. *Woody endocarp* crested on one side, with 2 long claws.

ORDER 70. **ACANTHACEÆ.**—*Acanthus Family.*

Chiefly herbs, with opposite simple leaves, didynamous or diandrous stamens, inserted on the tube of the more or less 2-lipped corolla. FRUIT an 8-celled and few-seeded capsule. CALYX 5-cleft. COROLLA 5-lobed, subequal. STYLE thread-form STIGMA simple or 2-cleft. CAPSULE loculicidal; SEEDS anatropous, supported by hooked projections of the placentæ.

1. DIANTHERA. Gronov.

Gr. *dis*, double, and *anthera*, anther; the separated cells giving the appearance of 2 anthers on each filament.

CALYX 5-parted. COROLLA deeply 2-lipped; the *upper lip* erect, notched; the *lower* spreading, 3-parted. STAMENS 2; ANTHERS 2-celled, the cells placed one lower down than the other. CAPSULE obovate, compressed, attenuated at the base, 4 to 5-seeded.—*Perennial herbs, growing in water, with narrow and entire leaves, and purplish flowers in axillary peduncled spikes or heads.*

1. D. AMERICANA, L. *Water Willow.*

Leaves linear-lanceolate, elongated; *spikes* oblong, dense, long-peduncled. (*Justicia pedunculosa*, L.)

Borders of streams and ponds; common. July, Aug. *Root* creeping. *Stem* 3 feet high, simple or sparingly branched above. *Leaves* nearly 6 inches long, smooth, wavy, contracted to a short petiole. *Flowers* pale-purple.

2. DIPTERICANTHUS, Nees. (RUELLIA, partly, L.)

Gr. *dipteros*, 2-winged, and *akanthos*, the Acanthus; on account of the 2-leaved peduncles.

CALYX deeply 5-cleft. COROLLA funnel-form; the spreading limb nearly regularly and equally 5-cleft. STAMENS 4, included, didynamous; ANTHERS arrow-shaped; CELLS parallel, and nearly equal. CAPSULE somewhat compressed, and stalked at the base, 8 to 12-seeded. SEEDS with a mucilaginous coating.—*Perennial herbs, with ovate or elliptical nearly entire leaves, leafy bracts, and clustered blue or purple flowers.*

1. D. STREPENS, Nees. *Two-winged Acanthus.*

Somewhat smooth; *leaves* ovate or ovate-oblong, entire; *peduncles* axillary, very short; *calyx-lobes* lanceolate, acute, ciliate, spreading, shorter than the tube of the corolla. (*Ruellia strepens*, L.)

Shady woods. July. *Stem* 1 to 2 feet high, often simple, clothed with white bristly hairs. *Leaves* 1½ to 2½ inches long ⅓ to ½ as wide. *Corolla* 2 inches long, bright bluish-purple, 1 to 1½ inch broad, with a long and slender tube.

3. THUNBERGIA, Linn.

In honor of *Charles Peter Thunberg*, Professor of Botany at the University of Upsal

CALYX double, 5-cleft, with 2 bracts. COROLLA bell-shaped, with an inflated tube, and 5-lobed limb; *lobes* equal. STIGMA 2-lobed. CAPSULE globose, beaked, 2-celled.—*Mostly climbing herbs, with showy axillary flowers.*

1. T. ALATA, L. *Black-eyed Susan.*

Stem twining; *leaves* triangularly-cordate, sinuately toothed, 5-nerved; *petioles* winged. July. Native of the East Indies. *Flowers* 1 to 1½ inch broad, pale, buff or orange, with a deep-purple throat.

ORDER 71. SCROPHULARIACEÆ.—*Figwort Family.*

Chiefly herbs, with didynamous, diandrous, or very rarely 5 stamens inserted on the tube of the 2-lipped or more or less irregular corolla. CALYX of 5 more or less united sepals, persistent. OVARY 2-celled, with a single style. FRUIT a 2-celled and usually many-seeded capsule, with the placentæ in the axis.

SUB-ORDER I. ANTIRRHINIDEÆ. THE SNAPDRAGON-FAMILY.

Upper lip of the corolla covering the lobes of the lower in the bud. Capsule usually septicidal.

1. VERBASCUM, Linn. MULLEIN.

The ancient Latin name, altered from *Barbascum*.

CALYX 5-parted. COROLLA 5-lobed, open or concave, rotate, the lobes nearly equal rounded. STAMENS 5, perfect, often hairy, the anterior longer. STYLE flattened at the apex. CAPSULE ovoid or globose, many-seeded.—*Tall biennial herbs, usually woolly, with alternate leaves, and ephemeral flowers in terminal spikes or racemes.*

1. V. THAPSUS, L. *Common Mullein.*

Densely woolly throughout; *stem* simple tall and stout; *leaves* ovate-oblong, decurrent; *flowers* in a prolonged dense cylindrical spike; *lower stamens* usually beardless.

Fields and roadsides; very common. Introduced from Europe. June. *Stem* 3 to 6 feet high, angular, winged. *Leaves* 6 to 12 inches long. *Flowers* yellow in a long dense cylindric spike.

2. V. BLATTARIA, L. *Moth Mullein.*

Green and nearly smooth; *leaves* oblong, clasping, crenate-serrate; the *radical ones* petioled, oblong, doubly serrate, sometimes lyre-shaped; *raceme* long and loose; *filaments* all bearded.

Roadsides, common; Introduced from Europe. June, July. *Stem* 2 feet high, angled. *Leaves* acute, serrate or toothed. *Flowers* yellow or white, with a purplish tinge, on pedicels nearly an inch long. *Stamens* unequal, purplish; the *filaments* all hairy.

3. V. Lychnitis, L. *White Mullein.*

Clothed with a thin powdery woolliness; *leaves* oblong, wedge-form, greenish above; *flowers* in a pyramidal panicle; *filaments* white-woolly.

Old fields, roadsides, rare. Introduced from Europe. July, Aug. *Stem* 2 to 5 feet high, angular. *Flowers* pale-yellow. *Calyx* small, with lance-subulate segments.

2. LINARIA, Tourn. Toad-flax.

Named from *Linum*, the flax, which the leaves of some species resemble.

Calyx 5-parted. Corolla personate, with the prominent palate nearly closing the throat, spurred at the base on the lower side. Stamens 4, didynamous. Capsule ovoid or globose, opening below the summit by 1 or 2 pores or chinks, the orifice split into teeth. Seeds numerous.—*Herbs with the lower leaves opposite or whorled, the upper alternate, and solitary, axillary flowers often forming terminal leafy racemes.*

1. L. canadensis, Spreng. *Wild Toad-flax.*

Smooth; *stem* slender, erect, mostly simple, with scattered linear leaves; *flowers* racemed, on short pedicels; *spur* thread-form, curved.

Low grounds. May—Aug. Annual. *Stem* about 1 foot high, slender, often throwing out suckers at the base, which bear oblong, crowded, mostly opposite or whorled leaves. *Flowers* blue, in a slender raceme, variable in size.

2. L. vulgaris, Mill. *Common Toad-flax.*

Smooth and glaucous; *stem* erect; *leaves* alternate, crowded, linear-lanceolate; *flowers* in a dense raceme, on pedicels shorter than the bracts; *spur* awl-shaped.

Roadsides and waste places; common. June—Oct. Per. *Stem* 1 to 2 feet high, sometimes somewhat branched. *Flowers* large and numerous, pale yellow, with a deep orange palate, hairy in the throat, in a dense bracteate raceme, rarely with 3 to 5 spurs.

3. L. Elatine, Mill. *Sharp-pointed Toad-flax.*

Hairy; branched from the base; *leaves* alternate, ovate-halbert-form, petioled; *flowers* axillary, on slender peduncles; *spur* slender.

Fields and banks, sparingly introduced. July. Ann. *Stem* procumbent, 1 to 3 feet high, with spreading branches. *Flowers* yellow and purplish, small.

3. ANTIRRHINUM, Linn. Snap-dragon.

Gr. *anti*, like, *rin*, a nose; from the resemblance of the flowers to the snout of some animals.

Calyx 5-sepalled. Corolla gibbous (not spurred) at base, the upper lip 2-parted, lower 3-parted, closed by the prominent palate. Capsule without valves, opening by 3 pores,—*European herbs, with the lower leaves opposite, the upper alternate, and showy flowers in leafy terminal racemes.*

1. A. MAJUS, L. *Great Snap-dragon.*

Leaves lanceolate, opposite; *flowers* in racemes; *sepals* glandular-hairy, smooth, lanceolate, acute. A showy garden flower, native of England. *Stem* 1 to 2 feet high. *Flowers* large, rose-colored, the lower lip white and the mouth yellow, with a gibbous prominence at the base beneath. There are numerous varieties with scarlet, scarlet and white, and white flowers. June, July.

4. SCROPHULARIA, Tourn. FIGWORT.

So called from its supposed virtues in curing *scrophula.*

CALYX deeply 5-cleft. COROLLA subglobose; *limb* contracted, with 2 short lips; *upper lip* 2-lobed, frequently with a scale or abortive stamen at the summit of the tube. CAPSULE 2-celled, 2-valved, many-seeded.—*Rank herbs, with mostly opposite, leaves, and small greenish-purple or lurid flowers, in loose cymes forming a terminal panicle.*

1. S. NODOSA, L. *Common Figwort.*

Smooth, tall and branching; *Stem* 4-sided; *leaves* ovate, oblong or the upper lanceolate, acute, cut-serrate, rounded or heart-shaped at the base. (S. lanceolata, Pursh, S. nodosa, Benth, in DC.)

Woods and hedges; common. June—Aug. Per. *Stem* 3 to 5 feet high. *Leaves* 3 to 7 inches long, thin, often long-acuminate. *Flowers* ovoid ¼ to ½ inch long, purple-brown tinged with green.

5. COLLINSIA, Nutt.

In honor of *Z. Collins* of Philadelphia, an accurate botanist.

CALYX deeply 5-cleft. COROLLA bilabiate, the orifice closed; *upper lip* 2-cleft; *lower* 3-cleft, its middle lobe keeled and sac-like, infolding the 4 declined stamens and style. CAPSULE globose, many-seeded.—*Slender branching annuals, with opposite leaves, and handsome flowers in umbel-like clusters, appearing whorled in the axils of the upper leaves.*

1. C. BICOLOR, Benth. *Two-colored Collinsia.*

Stem upright, somewhat branched; *leaves* ovate-lanceolate, remotely serrate or nearly entire, sessile with a somewhat heart-shaped base; *flowers* in axillary racemes. A pretty annual plant from the Rocky Mountains; common in cultivation. *Stem* 4 to 8 inches high, with opposite leaves and branches. *Leaves* 1 to 2 inches long, ¼ to ¾ inch wide, broadest at the base. *Flowers* showy, ½ to ¾ inch long. *Corolla* white, the lower lip a beautiful violet-purple.

6. CHELONE, Tourn. SNAKE-HEAD.

Gr. *kelone*, a tortoise; the corolla much resembling in shape the head of that animal.

CALYX 5-sepaled, imbricated. COROLLA inflated-tubular, with the mouth a little open; *upper lip* broad, concave, keeled in the middle, notched at the apex; the *lower lip* spreading 3-cleft, bearded in the throat. STAMENS 4, didynamous, with a 5th shorter sterile filament; ANTHERS heart-shaped, woolly. CAPSULE 2-celled, 2-valved, many-seeded; SEEDS wing-margined.—*Smooth perennials, with upright branching stems, opposite serrate leaves, and large white or purplish flowers, sessile, in spikes or clusters, and closely imbricated with roundish bracts and bractlets.*

1. C. GLABRA, L. *Turtle-head. Balmony Shell-flower.*

Leaves very short-petioled, lanceolate, pointed; *flowers* in dense spikes.

Wet places; common. Aug.—Oct. *Stem* 2 to 3 feet high, simple. *Leaves* thick, and somewhat coriaceous, varying from narrow to very broad-lanceolate. *Flowers* large, white or reddish.

7. PENTSTEMON, Mitchell.

Gr. *pente*, five, and *stemon*, a stamen; in allusion to the 5th large abortive stamen.

CALYX 5-parted. COROLLA tubular, more or less inflated, mostly 2-lipped; the *upper lip* 2-lobed, and the *lower* 3-cleft, STAMENS 4, declined at the base, ascending above; and a fifth sterile filament, mostly as long as the others, either naked or bearded. CAPSULE ovoid, 2-celled, 2-valved.—*Perennial herbs, branches at the base, with opposite leaves, and showy flowers in thyrsoid panicles.*

1. P. PUBESCENS, Soland. *Beard-tongue.*

Somewhat pubescent; *radical leaves* petioled, ovate or oblong; *stem-leaves* lanceolate from a clasping base, serrate, sometimes entire; *flowers* loosely panicled; *sterile filament* bearded from the top to below the middle.

Hills and river banks; common. June—Sept. *Stem* 12 to 15 inches high, round, smooth below, supporting a loose oppositely branched panicle of bluish-purple flowers. *Corolla* 1 inch long, gradually enlarged upwards, flattened and 1-ridged on the upper side. Sometimes quite smooth, when it is P. *lævigatus*, Soland, &c.

8. PAULONIA, Siebold.

CALYX deeply 5-cleft, fleshy. COROLLA-TUBE long, declinate, enlarged above, *limb* oblique, with rounded segments. STAMENS 4, arched downwards. CAPSULE woody, acuminate; *valves* septiferous in the middle. SEEDS numerous.—*A magnificent flowering tree, native of Japan, with large leaves, and large terminal panicles of numerous purplish flowers.*

1. P. IMPERIALIS, Siebold. *Paulonia.*

Leaves broad-cordate-ovate, entire or somewhat 3-lobed, villous-canescent on both sides, smoothish above when full grown. A splendid tree with the habit of

Catalpa, recently introduced in cultivation in this country! *Branches* crooked, nearly horizontal. *Leaves* 7 to 20, by 15 or 20 inches, opposite, on petioles. *Panicles* large, terminal, many-flowered. *Corolla* 2 inches long, pale-violet, striped within, somewhat fragrant. (*Bignonia tomentosa;* Thunb.)

9. DIGITALIS, Linn. FOXGLOVE.

Lat. *digitabulum*, a thimble; from the form of the flowers.

CALYX 5-parted. COROLLA bell-shaped, ventricose, in 5 subequal lobes. CAPSULE ovate, 2-celled, 2-valved, with a double dissepiment.—*European and Asiatic herbs or shrubs, cultivated for ornament, with large flowers in showy racemes.*

1. D. PURPUREA, L. *Purple Foxglove.*

Leaves oblong, rugose, crenate; *calyx segments* ovate-oblong; *corolla* obtuse, upper lip entire; *peduncles* as long as the calyx. Native of Europe. A well known biennial showy border flower, 2 to 3 feet high, with large, rough, downy leaves. *Flowers* numerous, in a long, simple spike, large crimson or purplish, often white, with beautiful spots within. Medicinal.

2. D. GRANDIFLORA, Allioni. *Great yellow Foxglove.*

Leaves ovate or oblong-lanceolate, veiny, serrulate, amplexicaul; *raceme* tomentose, lax; *calyx segments* lanceolate, acute; *corolla* ventricose-bell-shaped, segments broader than long, lowest twice as broad as the lateral. Native of Europe. A perennial plant 2 to 3 feet high. *Flowers* 1½ inch long, yellow, varying to brownish or orange.

10. MIMULUS, Linn. MONKEY-FLOWER.

Gr. *mimo*, an ape, on account of the gaping corolla.

CALYX prismatic, 5-angled, 5-toothed, the upper tooth largest. COROLLA tubular; the *upper lip* erect or reflexed-spreading, 2-lobed; the *lower* spreading, 3-lobed. STAMENS 4. STIGMA 2-lipped. CAPSULE 2-celled, many-seeded.—*Prostrate or erect herbs, with square stems, opposite leaves, and mostly handsome flowers on solitary axillary peduncles.*

1. M. RINGENS, L. *Purple Monkey-flower.*

Erect, smooth; *leaves* oblong or lanceolate, pointed, serrate, clasping by a heart-shaped base; *peduncles* larger than the flowers. Per.

Wet places; common. July, Aug. *Stem* 1 to 2 feet high, somewhat branched. *Flowers* pale-purple, ringent. *Calyx-teeth* acuminate from a broad base.

2. M. ALATUS, Ait. *Wing-stem Monkey-flower.*

Stem somewhat winged at the angles above; *leaves* oblong-ovate, tapering into a petiole; *peduncles* shorter than the calyx; *calyx-teeth* very short, abruptly pointed. Per.

Low grounds, rare. Aug. *Stem* 2 feet high with winged angles, somewhat branched. *Flowers* pale-blue, ringent.

11. HERPESTIS, Gært.

Gr. *herpestes*, a creeper; from the prostrate habit of the plants.

CALYX 5-parted, unequal. COROLLA bilaliate; *upper lip* notched or 2-lobed; the *lower* 3-lobed. STAMENS 4, didynamous. STYLE concave, dilated or 2-lobed at the apex. SEEDS small, numerous.—*Prostrate or creeping herbs, with opposite leaves and inconspicuous solitary or subracemose flowers.*

1. H. MONNIERIA, Humboldt. *Wedge-leaved Herpestes.*

Smooth, fleshy, prostrate; *leaves* wedge-obovate, entire or obscurely crenate near the summit; *pedicels* as long as the leaves, with 2 bracteoles near the calyx; *calyx segments* ovate. Per.

Inundated banks. Aug. *Leaves* opposite, thick, somewhat clasping, variable in size and form. *Flowers* very small, pale purple, on peduncles about as long as the leaves.

2. H. MICRANTHA, Pursh.

Smooth, prostrate; *leaves* oval, entire, sessile or clasping, obscurely many-veined; *pedicels* ebracteate, nearly as long as the leaves; *corollo* scarcely longer than the calyx.

Border of pools and rivers. Aug. A minute weed, 2 to 4 inches in length. *Leaves* about ¼ inch long, 5 to 7-veined. *Flowers* very small, blue.

12. GRATIOLA, Linn. HEDGE-HYSUP.

Name from *gratia*, grace or favor; on account of its supposed excellent medicinal properties.

CALYX 5-parted; the divisions narrow and nearly equal. COROLLA tubular subbilabiate; *upper lip* entire or 2-cleft, the *lower* 3-cleft. STAMENS 4, 2 sterile or wanting. STYLE dilated or 2-lipped at the apex. CAPSULE ovate, 4-valved, many-seeded.—*Low mostly branched and diffuse herbs, with opposite sessile leaves, and axillary 1-flowered peduncles, usually with 2 bractlets at the base of the calyx.*

1. G. VIRGINIANA, L. *Common Hedge-Hysup.*

Smooth or nearly so; *leaves* lanceolate, slightly serrate, narrowed at the base; *peduncles* longer than the leaves; *calyx segments* linear-lanceolate, equal; *sterile filaments* nearly wanting. Ann.

Wet places; common. July, Aug. *Plant* 4 to 6 inches high, branched at base. *Leaves* 1 to 2 inches long, and ½ as wide, sessile. *Corolla* whitish, the tube pale yellow, often tinged with purple, scarcely ½ inch long. *Calyx* with 2 linear-lanceolate bracts, which are rather longer than the sepals.

2. G. MEGALOCARPA, Ell. *Large-pointed Hedge-Hysup.*

Leaves lanceolate, serrate, pubescent; *peduncles* opposite, longer than the leaves; *calyx segments* linear, as long as the globose capsule. (G. *acuminata* of Pursh.) Per.

Ditches and pools. July, Aug. *Flowers* pale-yellow, large. *Capsule* larger than in any other species.

13. ILYSANTHES, Raf. (LINDERNIA, Muhl.)

Gr. *ilus*, mud, *anthos*, flower; alluding to their place of growth.

CALYX 5-parted, nearly equal. *Upper lip* of the corolla short, erect, 2-lobed, the *lower* larger and spreading, 3-cleft. STAMENS 2, fertile and 2 sterile filaments forked, one of the divisions glandular, the other smooth, acute, or rarely with half an anther. STYLE 2-lipped at the apex. CAPSULE ovate or oblong, many-seeded.—*Small smooth herbs, with opposite leaves and small axillary flowers, or the upper racemed.*

1. I. GRATIOLOIDES, Benth. *False Pimpernel.*

Much branched, diffusely spreading; *leaves* ovate, rounded, or oblong, or the lower obovate, slightly toothed or entire, mostly obtuse, the upper partly clasping; *capsule* ovoid-oblong, a little longer than the calyx. Ann. (*Lindern ia dilatata*, and L. *attenuata* of Muhl.)

Low grounds, and along rivulets; common; flowering all summer. *Leaves* variable in size, ½ to ¾ inch long. *Corolla* much exserted, nearly ½ inch long, bluish-white.

14. HEMIANTHUS, Nutt.

Gr. *hemi*, half, *anthos*, flower; alluding to the uneqally divided corolla.

CALYX 4-toothed, equal. COROLLA 2-lipped; the *upper lip* very short, entire; *lower* 3-lobed, the middle lobe long, spreading. STAMENS 2, anterior, with a scale at the base of the filament. STYLE short. CAPSULE globular, 1-celled, 2-valved, many-seeded.—*A small inconspicuous annual, with crowded opposite roundish leaves, and minute solitary flowers sessile in the axils of the leaves.*

1. H. MICRANTHEMOIDES, Nutt. *Creeping Hemianthus.*

Creeping and rooting; *stem* dichotomously branched; *leaves* roundish-ovate, opposite, crowded, sessile, obscurely 3-veined.

Inundated banks of the Delaware below Philadelphia. Aug., Sept. *Stem* 1 to 2 inches long, branched.

SUB-ORDER II. RHINANTHIDEÆ.

Inflorescence entirely centripetal or compound. Lateral lobes of the corolla or one of them outermost in the bud.

15. LIMOSELLA, Linn. MUDWORT.

Lat. *limus*, mud; in allusion to its place of growth.

CALYX bell-shaped, 5-toothed. COROLLA shortly companulate, 5-cleft, equal. STAMENS 4; ANTHERS by confluence 1-celled. STYLE short, club-shaped. CAPSULE globular, 2-valved, many-seeded.—*Small annuals, growing* *in mud, creeping by slender runners, with entire fleshy leaves in dense clusters around the simple 1-flowered peduncle.*

1. L. TENUIFOLIA, Nutt. *Common Mudwort.*

Leaves terete, awl-shaped or thread-form, scarcely dilated at the apex; *scape* 1-flowered, as long as the leaves.

Muddy shores. Aug. *Leaves* about 1 inch long. *Flowers* bluish-white, minute.

16. VERONICA, Linn. SPEEDWELL.

Name of doubtful origin.

CALYX 4-parted. COROLLA with a 4-cleft spreading border, *lower segments* mostly narrow. STAMENS 2, one each side of the upper lobe of the corolla, exserted. STYLE entire; STIGMA single. CAPSULE flattened, usually obtuse or notched at the apex, 2-celled, few to many-seeded.—*Chiefly herbs, with various foliage, and blue, flesh-color or white flowers, axillary or racemed.*

* *Spikes or racemes terminal. Perennials.*

1. V. SERPYLLIFOLIA, L. *Thyme-leaved Speedwell.*

Much branched, at the base, low; *branches* ascending, simple; *leaves* ovate or oblong, obscurely crenate, smoothish; *racems* elongated, many-flowered; *capsule* inversely heart-shaped, as long as the style.

Roadsides and fields. common; introduced and indigenous. May—July. *Stem* procumbent, 3 to 8 inches long, sometimes creeping. *Leaves* rather fleshy, 3-veined, ½ to 1 inch long. *Corolla* scarcely exceeding the calyx, blue and white, beautifully penciled with purple lines.

** *Spikes or racemes axillary. Perennials.*

2. V. SCUTELLATA, L. *Marsh Speedwell.*

Smooth, ascending, slender and weak; *leaves* sessile, linear, acute, somewhat toothed; *racemes* very slender, zig-zag, with the flowers few and scattered; *capsule* flat, much broader than long, notched at both ends.

Moist places, common. June—Aug. *Plant* 8 to 12 inches high. *Leaves* 2 to 3 inches long, ¼ to ½ inch wide. *Flowers* flesh-colored or bluish, in simple rarely compound racemes.

3. V. ANAGALLIS, L. *Water Speedwell.*

Smooth, creeping and rooting at the base, erect above; *leaves* sessile, mostly clasping by a heart-shaped base, ovate-lanceolate, acute, serrate or entire; *pedicels* spreading; *capsule* orbicular, slightly notched.

Brooks and ditches. June—Aug. *Stem* 1 to 2 feet high, succulent. *Leaves* 2 to 3 inches long, ¼ to ½ inch wide. *Flowers* numerous, blue or purplish. *Corolla* marked with purple lines.

4. V. AMERICANA, Shweinitz. *American Brooklime.*

Smooth, decumbent at the base, then erect; *leaves* ovate or oblong, mostly petioled, acutish, serrate, thickish, somewhat cordate at base; *capsule* rounded, turgid, notched. (V. Beccabunga. *American authors.*)

Brooks and ditches; common. June—Aug. *Stems* 8 to 15 inches high. *Leaves* 1 to 2 inches long, ⅓ to ½ as wide. *Flowers* blue or bluish-purple, on racemes longer than the leaves.

5. V. OFFICINALIS, L. *Common Speedwell.*

Pubescent throughout; *stem* prostrate, rooting at the base; *leaves* obovate-elliptical or wedge-oblong, short-petioled, obtuse, serrate; *racemes* densely many-flowered; *capsule* triangular-obovate, broadly notched.

Dry hills and woods; common. May—July. *Plant* trailing, 6 to 12 inches long, with ascending branches. *Leaves* mostly elliptical, 1 to 1½ inch long. *Flowers* pale blue, in long, erect, pedunculate spikes.

*** *Flowers axillary, solitary, scarcely racemed. Annuals.*

6. V. PERIGRINA, L. *Neck-weed. Purslane Speedwell.*

Nearly smooth, ascending, branched; *lower leaves* petioled, oval oblong, toothed, the others sessile, oblong, obtuse; the upper oblong-linear and entire; *capsule* orbicular, slightly notched.

Cultivated grounds; common, introduced. April—June. *Plant* often branched from the base, 4 to 10 inches high. *Leaves* thickish. *Flowers* very small, white or pale blue, nearly or quite sessile.

7. V. ARVENSIS, L. *Corn Speedwell.*

Simple or diffusely branched, hairy; *lower leaves* ovate, crenate, petioled; the *uppermost* sessile, lanceolate, entire; *flowers* subsessile; *capsule* inversely heart-shaped, the *lobes* rounded.

Cultivated grounds; common, introduced. June. *Stem* 3 to 8 inches high. *Flowers* on short peduncles, very small, pale blue, beautifully pencilled with purple lines.

8. V. AGRESTIS, L. *Field Speedwell.*

Prostrate, hairy; *leaves* petioled, cordate-ovate or round, crenate-toothed; calyx-*lobes* ovate-lanceolate; *peduncles* as long as the leaves; *capsule* nearly orbicular, sharply notched, few seeded.

Sandy fields, introduced. May—Oct. *Stem* 3 to 4 inches long, round, leafy, branching nearly at the base. *Flowers* small, light blue or white, veined.

9. V. HEDERÆFOLIA, L. *Ivy-leaved Speedwell.*

Prostrate, hairy; *leaves* petioled, cordate, roundish, 3 to 5 toothed or lobed; *peduncles* scarcely longer than the leaves; *sepals* triangular, sub-cordate, acute, at length erect: *capsule* turgid and wrinkled, 2-lobed.

Shady rocks and hills; sparingly naturalized. March—May. *Stem* slender, 4 to 10 inches long, diffusely branched. *Calyx* somewhat 4-angled in fruit. *Corolla* smaller than the calyx, blue.

**** *Exotics. Perennials.*

10. V. SPICATA, L. *Spiked Garden Speedwell.*

Erect, tall; *leaves* petiolate, ovate-oblong or lanceolate, *lower ones* obtuse, crenate, *upper* acute, crenate-serrate, entire at apex; *raceme* mostly solitary; *pedicels* much shorter than the sepals; *calyx* mostly hoary-pubescent. Cultivated in gardens; native of Europe and Asia. Varieties numerous, with flowers blue, rose-color &c.

17. LEPTANDRA, Nutt.

Gr. *leptos*, slender, and *aner, andros*, a man; in allusion to the stamens.

CALYX 5-parted; *segments* acuminate. COROLLA tubular-bell-shaped; *border* 4-lobed, somewhat ringent, the *lower segments* narrower. STAMENS 2, and with the pistil at length much exserted. CAPSULE ovoid, acuminate, 2-celled, many-seeded, opening at the summit.—*Tall perennials, with mostly whorled leaves and dense spiked terminal racemes of white flowers.*

1. L. VIRGINICA, Benth. & Nutt. *Virginia Speedwell.* *Stem* erect; *leaves* whorled in 4s to 7s, short petioled, lanceolate, acute or pointed finely serrate; *spikes* panicled, crowded.

Rich moist places, often cultivated. July. *Stem* 2 to 4 feet high, angular, simple. *Flowers* numerous, white, nearly sessile in long terminal and verticellate, subterminal spikes. *Capsule* many-seeded. The root is medicinal. *Culver's Physic.*

18. BUCHNERA, Linn. BLUE-HEARTS.

In honor of *J. G. Buchner*, an early German botanist.

CALYX tubular, obscurely nerved, 5-parted. COROLLA salver-form, with a straight or curved tube, and a nearly regularly 5-cleft limb. STAMENS 4, included, approximate in pairs. STYLE club-shaped and entire at the apex. CAPSULE 2-valved, many-seeded.—*Perennial rough-hairy herbs, with opposite leaves or the uppermost alternate, and blue flowers in terminal bracted spikes.*

1. B. AMERICANA, L. *Blue-Hearts.* Rough-hairy; *stem* mostly simple and wand-like; *lower leaves* obovate-oblong, obtuse; *upper ones* oblong and lanceolate, sparingly and coarsely toothed, veiny; *flowers* in an interrupted spike; *calyx* longer than the bracts.

Moist places. June—Aug. *Stem* 1 to 2 feet high. *Leaves* 2 to 3 inches long, very rough, appressed to the stem. *Flowers* axillary and sessile, blue or purple. *Corolla* 1 inch long, hairy. *Stamens* inserted 2 in the throat of the corolla and 2 in the middle of the tube.

19. GERARDIA, Linn.

In honor of *John Gerard* an English botanist.

CALYX bell-shaped, 5-toothed or 5-cleft. COROLLA bell-shaped-funnel-form, swelling above, with 5 more or less unequal lobes, the 2 upper smaller and usually more or less united. STAMENS 4, didynamous, included, hairy. STYLE elongated, mostly enlarged and flattened at the apex. CAPSULE ovate, pointed, many-seeded.—*Erect branching herbs, with the stem leaves opposite, or the upper often alternate, and showy purple or yellow flowers often in racemes or spikes.*

SEC. 1. GERARDIA proper. *Leaves linear; flowers purple.* Annual.

1. G. PURPUREA, L. *Purple Gerardia.* Upright, with long widely spreading rigid branches; *leaves* linear, acute, rough-margined; *flowers* nearly sessile; *calyx-teeth* subulate.

Swamps and low grounds. Aug.—Oct. *Stem* 1 to 2 feet high, rough on the angles. *Leaves* ¾ to 1 inch long, and nearly ¼ inch wide, coiled up in drying. *Flowers* large, axillary, often opposite, purple.

2. G. TENUIFOLIA, Vahl. *Slender Gerardia.*

Much branched, very slender, diffuse, nearly smooth; *leaves* linear, acute; *peduncles* axillary, thread-form, larger than the flowers; *calyx teeth* short, acute.

Dry woods, common. July—Sept. *Stem* 8 to 15 inches high, 4-angled. *Leaves* variable, about 1 inch long, very narrow, entire rough. *Corolla* ½ to ⅔ inch long, pale purple, spotted within, the border much spreading, smooth and nearly equal.

3. G. SETACEA, Walt. *Setaceous Gerardia.*

Very slender; *branchlets* and *leaves* setaceous, roughish; *peduncles* very much longer than the leaves; *calyx-teeth* awl-shaped; *capsule* ovate, larger than the calyx, at length exserted.

Dry woods, rare. Aug., Sept. *Plant* 8 to 12 inches high. *Corolla* small ¼ to ½ inch long.

SEC. 2. DASYSTOMA, Raf. *Leaves rather large; flowers yellow. Perennials.*

4. G. FLAVA, L. *Downy False Foxglove.*

Pubescent with a fine close down; *stem* tall, mostly simple; *leaves* ovate-lanceolate or oblong, obtuse, entire, the lower usually sinuate-toothed or pinnatifid; *peduncles* very short; *flowers* axillary.

Woods and rocky places, common. Aug. *Stem* 3 to 4 feet high, erect. *Lower leaves* variously pinnatifid, cut or toothed; *upper ones* very entire. *Flowers* large, yellow, trumpet-shaped.

5. G. QUERCIFOLIA, Pursh. *Glaucous False Foxglove.*

Smooth and glaucous, tall, mostly branching; *lower leaves* twice pinnatifid: the *upper* oblong-lanceolate, pinnatifid or entire; *peduncles* nearly as long as the calyx; *calyx-lobes* linear-lanceolate, acute, as long as the at length inflated tube.

Rich woods; common. Aug. *Stem* 2 to 5 feet high. *Flowers* large and of a brilliant yellow, opposite and axillary, near the top of the stem, forming a loose spike. *Corolla* trumpet-shaped, 2 inches long.

6. G. PEDICULARIA, L. *Bushy Gerardia.*

Smoothish or pubescent, much branched; *leaves* ovate-lanceolate, pinnatifid, the *lobes* cut and toothed; *pedicels* longer than the calyx; *calyx-lobes* toothed, as long as the hairy tube.

Dry woods; common. Aug. *Stem* 2 to 3 feet high, very leafy. *Leaves* 1 to 3 inches long, and ½ to 2 inches wide; *segments* crenately incised-serrate. *Flowers* yellow, 1 to 1½ inch long, villose. *Style* longer than the stamens.

SEC. 3. OTOPHYLLA, Benth.—*Upper leaves with a lobe at the base; corolla purple (rarely white), sparingly hairy inside. Annual?*

7. G. AURICULATA, Michx. *Auriculate Gerardia.*

Rough-hairy; *stem* erect, nearly simple; *leaves* lanceolate or ovate-lanceolate, the *upper* entire, the others with an oblong-lanceolate lobe at the base, on each side; *flowers* nearly sessile in the axils of the upper leaves, forming a prolonged and interrupted leafy spike.

Low grounds, rare. Aug., Sept. *Stem* 9 to 20 inches high. *Leaves* 1 to 1½ by ⅓ to ⅔ of an inch, entire on the margin, sessile. *Corolla* purple or rarely white, pubescent, dilated at the mouth, nearly 1 inch long.

20. CASTILLEJA, Mutis. PAINTED-CUP.

In honor of *Castillejo*, a Spanish botanist.

CALYX tubular, flattened, ventricose, 2 to 4-cleft. COROLLA 2-lipped; *upper lip* long and narrow, arched, keeled and flattened laterally, inclosing the stamens. STAMENS 4. CAPSULE ovoid-compressed, many-seeded.—*Herbs, with alternate entire or cut-lobed leaves, the floral ones dilated, colored and usually more showy than the pale-yellow or purplish spiked flowers.*

1. C. COCCINEA, Spreng. *Scarlet Painted-Cup.*

Hairy; *stem* simple; *root-leaves* clustered; *stem-leaves* lanceolate, pinnatifidly incised; *floral-leaves* trifid or incised, colored at the summit; *calyx* nearly equally 2-cleft, the *lobes* dilated at the apex, nearly entire the length of the corolla. Bien.

Low grounds. May, June. *Stem* 8 to 16 inches high, simple reddish or purple. *Floral-leaves* scarlet towards the summit. *Stem-leaves* alternate, sessile, with about 2, long, linear segments on each side. *Flowers* in a crowded spike, greenish-yellow. The variety *palens* of Pursh, having the floral-leaves dull-yellow is occasionally found.

21. SCHWALBEA, Gronov. CHAFF-SEED.

In honor of *Christian Schwalbe*, a German botanist.

CALYX declined, very oblique, tubular, 10 to 12-ribbed, 5-toothed, the *upper rib* much smaller, the anterior united much higher than the others. COROLLA bilabiate; *upper lip* arched, oblong, obtuse, entire; the *lower* shorter, erect, 2-plaited, with 3 very short obtuse lobes. STAMENS 4, didynamous, included in the upper lip. STYLE club-shaped at the apex. CAPSULE ovoid-roundish, 2-celled, 2-valved, many-seeded. SEEDS winged with the chaff-like coat.—*Perennial herbs, with alternate, sessile, entire leaves, and leafy simple stems, terminated by a loose spike of rather large dull yellow flowers.*

1. S. AMERICANA, L. *American Chaff-seed.*

Minutely pubescent; *stem* simple, leafy; *leaves* ovate or oblong, the *upper* gradually reduced into lanceolate and linear bracts, 3-nerved; *pedicels* very short, with 2 bractlets under the calyx.

Wet sandy soil; rare. May—July. *Plant* 1 to 2 feet high, somewhat viscid-pubescent. *Flowers* dull purple or yellowish, 1 to 1¼ inch long.

22. PEDICULARIS, Tourn. LOUSEWORT.

Lat. *pediculus*, a louse; of no obvious application.

CALYX tubular or bell-shaped, unequally 5-toothed or 2-lipped. COROLLA strongly 2-lipped; the *upper lip* arched, flattened, often beaked at the apex; the *lower* erect at the base, 2-crested above, 3-lobed, commonly spreading. STAMENS 4, under the upper lip. CAPSULE ovate or lanceolate, mostly oblique, several-seeded.—*Perennial herbs, with chiefly alternate pinnatifid leaves, and rather large flowers in terminal spikes.*

1. P. CANADENSIS, L. *Common Lousewort.*

Hairy; *stems* simple, low, clustered; *leaves* scattered; the *lowest* pinnatifidly parted, the others half pinnatifid; *spike* short and dense; *calyx* split in front, otherwise nearly entire, oblique; *upper lip of the corolla* hooded, incurved, 2-toothed under the apex.

Pastures and low grounds; common. May—July. *Plant* 5 to 12 inches high, often several stems from one root. *Leaves* 3 to 6 inches long, by 1 to 2 wide, chiefly radical. *Corolla* yellowish and purple, in a short terminal spike. *Capsule* compressed, somewhat sword-shaped.

2. P. LANCEOLATA, Michx. *Tall Lousewort.*

Stem upright, tall, nearly simple, mostly smooth; *leaves* sub-opposite, oblong-lanceolate, double-cut-toothed; *spikes* somewhat crowded; *calyx* bifid, with roundish-ovate segments; *upper lip of the corolla* truncate at the apex, the *lower* erect so as to nearly close the throat.

Low grounds. Aug., Sept. *Stem* 1 to 3 feet high. *Flowers* large, straw-color. *Calyx-lobes* leafy, crested. *Capsule* ovate, scarcely longer than the calyx.

23. MELAMPYRUM, Tourn. COW-WHEAT.

Gr. *melas*, black; and *puros*, wheat; from the color of the seeds, as they appear mixed with grain.

CALYX tubular, 4-cleft or 4-toothed. COROLLA ringent or personate; *upper lip* arched, compressed, with the margins folded back, the *lower lip* somewhat longer, biconvex, 3-lobed at the apex. STAMENS 4, under the upper lip. CAPSULE compressed, ovate, oblique or falcate, 2-celled, 1 to 4-seeded.—*Erect branching annuals, with opposite leaves, and solitary axillary, or leafy-spiked flowers.*

M. PRATENSE, L. Var. AMERICANUM, Benth. *Cow-wheat.*

Lower leaves lanceolate or linear lanceolate; *floral leaves* lanceolate, toothed at the base; *flowers* remote, one-sided, axillary.

Dry woods; common. June, July. *Stem* 8 to 12 inches high, branched above. *Leaves* opposite, 1 to 1½ by ¼ to ½ inch, the upper ones broader, with setaceous teeth at the base. *Flowers* slender, yellowish, the corolla twice the length of the calyx.

ORDER 72. **VERBENACEÆ.**—*Vervain Family.*

Herbs or shrubs, with opposite leaves, more or less 2-lipped or irregular corollas, and didynamous stamens, the 1 to 4 celled fruit, dry or drupaceous usually seperating when ripe into as many 1-seeded indehiscent nutlets. CALYX tubular 4 to 5-toothed, inferior, persistent. COROLLA tubular, irregularly 4 to 5-cleft, deciduous. SEEDS with little or no albumen.

1. VERBENA, Linn. VERVAIN.

The Latin name for any sacred herb; derivation obscure.

CALYX tubular, 5-toothed, with one of the teeth often shorter than the others. COROLLA tubular, often curved, salver-form, the border somewhat unequally 5-cleft. STAMENS 4 (rarely but 2), included, the upper pair sometimes without anthers, STYLE slender; STIGMA capitate. CAPSULE seperating into 4 seed-like nutlets.—*Herbs, with opposite leaves, and mostly alternately spicate, bracted flowers, rarely capitate or corymbed.*

1. V. HASTATA, L. *Blue Vervain.*

Tall; *leaves* lanceolate or oblong-lanceolate, acuminate, cut serrate, petioled, the lower often lobed and sometimes halbert-form at the base; *spikes* slender erect, densely flowered, corymbed or panicled. Per.

Low and waste grounds; common. July—Sept. *Stem* 3 to 4 feet high, with paniculate opposite branches above. *Leaves* rough, opposite. *Flowers* small, blue, arranged in long, close, imbricated spikes, erect and parallel to each other. *Seeds* 4. A variety with lance-ovate, or lance-oblong sharply serrate leaves and smaller flowers is occasionally met with; probably a hybred between this and the next species.

2. V. URTICIFOLIA, L. *Nettle-leaved Vervain.*

Erect, somewhat pubescent; *leaves* oval or oblong-ovate, acute, coarsely serrate, petioled; *spikes* very slender, at length much elongated with the flowers remote, loosely panicled; *flowers* tetrandrous.

Old fields and roadsides; common: introduced. July—Sept. Per. A roughish, hairy plant with slender spreading branches, 2 to 3 feet high. *Flowers* white, very small, remote, on divergent, slender spikes.

3. V. SPURIA, L. *Cut-leaved Vervain.*

Stem decumbent, loosely branched, diffuse; *leaves* sessile, pinnatifid, the lobes cut-toothed; *spikes* very slender, loosely panicled; *bracts* longer than the calyx; *upper stamens* imperfect. Annual or Biennial.

Sandy fields and roadsides; rare. Aug.—Oct. *Stem* square, 1 to 2 feet long, at length much branched, half erect. *Spikes* 3 to 6 inches long, bearing very small purplish-blue or rose-colored flowers, at length scattered on the spike.

4. V. ANGUSTIFOLIA, Michx. *Narrow-leaved Vervain.*

Dwarf, erect, mostly simple; *leaves* linear-lanceolate, attenuate at the base, remotely toothed; *spikes* solitary, the flowers at first crowded.

Dry hills or sandy fields. July—Sept. A small hairy species 6 to 12 inches high, with leaves 3 inches long, and ½ inch wide. *Flowers* purplish-blue, larger than in any of the preceding species.

5. V. MELINDRES, Lind. *Scarlet Verbena.*

Stem and *branches* spreading, hairy; *leaves* opposite, obovate or broad-lanceolate, deeply toothed, rough on the upper side, hairy beneath; *flowers* in terminal branches; *calyx* hairy, tubular, half as long as the corrolla. A beautiful perennial border flower, native of Buenos Ayres, blooming all summer, much cultivated in houses and conservitories. *Flowers* of a dazling scarlet, but in the numerous varieties some are white, lilac, purple, pink and flesh color. *Corolla* with a spreading limb, the 3 lower segments larger than the 2 upper ones.

2. PHRYMA, Linn. LOPSEED.

CALYX cylindrical, 2-lipped; *upper lip* of 3 bristle-awl-shaped teeth; *lower* shorter, 2-toothed. COROLLA 2-lipped; *upper lip* notched; *lower* much larger, 3-lobed. STAMENS 4, included. STYLE slender. STIGMA 2-lobed. FRUIT oblong, 1-celled, 1-seeded.—*A perennial herb, with slender* *branching stems, coarsely toothed ovate leaves, and small purplish or rose color opposite flowers, in elongated and slender terminal spikes.*

1. P. LEPTOSTACHYA, L. *Slender-spiked Lopseed.*

Leaves ovate, acute, coarsely and unequally toothed, petioled; *calyx* in fruit reflexed.

Rich sandy woods, common. July. *Stem* 2 to 3 feet high, with a few spreading branches above. *Leaves* 3 to 6 inches long, thin, on short stalks. *Flowers* small, mostly opposite.

3. LIPPIA, Linn. (ZAPANIA. Juss.)

In honor of *Lippi*, an Italian traveler and naturalist.

CALYX compressed, 2 to 4 parted, 2-lipped. COROLLA tubular, strongly 2-lipped; *upper lip* notched; the *lower* much longer, 3-lobed. STAMENS 4, included. STYLE slender; STIGMA obliquely capitate. FRUIT 2-celled, 2-seeded.—*Shrubs or prostrate herbs, with opposite leaves, and heads of flowers on axillary peduncles.*

1. L. NODIFLORA, Michx. *Fog-fruit.*

Procumbent or creeping; *leaves* wedge-ovate or oblanceolate, serrate above; *peduncles* axillary, slender, bearing solitary closely bracted heads of flowers. Per.

Low grounds. July. *Stem* 6 to 8 inches long, branching. *Leaves* with conspicuous veins, 1 to 2 inches long, ⅓ to ½ as wide, on petioles ¼ to ½ inch long. *Peduncles* 2 to 3 inches long, bearing ovoid or roundish heads of bluish-white flowers.

ORDER 73. **LABIATÆ.**—*Mint Family.*

Chiefly herbs, with square stems, opposite aromatic leaves, more or less 2-lipped corolla, didynamous or diandrous stamens, and a deeply 4-lobed ovary, which forms in fruit 4 *little seed-like nutlets or achenia surrounding the base of the single style in the persistent calyx, each filled with a single erect seed.* FLOWERS axillary or opposite, without stipules. CALYX tubular, regularly 5-toothed or cleft. UPPER LIP of the corolla 2-lobed or sometimes entire; the LOWER 2-parted. STAMENS inserted on the tube of the corolla. STYLE 2-lobed at the apex.

1. ISANTHUS, Michx. FALSE PENNYROYEL.

Gr. *isos*, equal, and *anthos*, a flower; referring to the nearly regular corolla.

CALYX bell-shaped, deeply 5-toothed, equal, 10-nerved. COROLLA nearly regular, 5-lobed; the *lobes* nearly equal, rounded, spreading. STAMENS 4, nearly equal, erect, distant, scarcely as long as the corolla. ACHENIA wrinkled and pitted.—*A low branching clammy-pubescent annual, with entire leaves, and small pale blue flowers on short axillary* 1 *to* 3-*flowered peduncles.*

1. I. CÆRULEUS, Michx. *False Pennyroyel.*

Viscid hairy; *leaves* oblong-lanceolate, strongly 3-nerved.

A branching leafy herb with the aspect of the pennyroyel. Gravelly banks, common. July-Aug. *Plant* about a foot high. *Stem* round, slender. *Leaves* 1 inch long, and ¼ as wide. *Flowers* numerous, blue with included stamens. The whole plant when rubbed, emits a balsamic odor.

2. MENTHA, Linn. MINT.

Mintha or *minthe*, an ancient Greek term.

CALYX bell-shaped or tubular, 5-toothed, equal or nearly so. COROLLA with a short included tube, the border bell-shaped, nearly equally 4-cleft, the upper tube broadest, entire or notched at the apex. STAMENS 4, equal, erect, distant. ACHENIA smooth.—*Aromatic herbs, with opposite leaves, and small pale purple or whitish flowers mostly in close clusters, forming axillary capitate whorls, sometimes approximated in interrupted spikes.*

* *Nearly smooth; naturalized. Perennials.*

1. M. VIRIDIS, L. *Spearmint.*

Leaves nearly sessile. ovate-lanceolate, unequally serrate; *flowers* in approximate loose panicled spikes; *calyx* somewhat hairy.

Low grounds; perfectly naturalized. July, Aug. *Stem* 1 to 2 feet high, branched, 4-angled. *Spikes* somewhat panicled. long. composed of distinct cymes. apparently whorled, a little remote from each other. *Corolla* pale purple. *Style* much exserted.

2. M. PIPERITA, L. *Peppermint.*

Leaves smooth, petioled, ovate-oblong, acute, serrate; *whorls of flowers* crowded in short obtuse spikes, interrupted at the base; *calyx-teeth* hairy.

Low grounds and along brooks; common. Aug. *Stem* 1 to 2 feet high, arising from underground running shoots, branched, often purplish. *Leaves* dark green, sharply serrate, rounded at the base. *Flowers* pale purple. Medicinal. Native of Europe.

3. M. ARVENSIS, L. *Corn Mint.*

Ascending, pubescent; *leaves* petioled, ovate or oblong, serrate; *flowers* in globose remote whorls; *calyx* mostly hairy.

Fields and hedgerows; common. July. *Stem* stout often erect, about 1 foot high. *Leaves* varying to oblong or ovate-lanceolate, sometimes nearly smooth, 1 to 2 inches long, and ½ as wide. *Flowers* small, numerous, pale purple. *Stamens* exserted. The plant when bruised emits the odor of decayed cheese. Native of Europe.

** *Truly indigenous species. Perennials.*

4. M. CANADENSIS, L. *Wild Mint. Canadian Mint.*

Stem low, spreading, whitish-hairy; *leaves* petioled, oblong, lanceolate or oval-lanceolate, serrate; *flowers* numerous, in globular axillary whorls; *calyx* hairy; *stamens* exserted.

Moist grounds and shady places; common. July—Sept. *Plant* grayish-green, with the odor of Pennyroyel, 1 to 2 feet high. *Leaves* hairy, especially beneath, tapering to both ends. *Flowers* pale-purple.

3. LYCOPUS, Linn. Water Horehound.

Gr. *lukos*, a wolf, and *pous*, a foot; from some fancied resemblance in the leaves.

Calyx oblong-bell-shaped, 4 to 5-toothed. Corolla bell-shaped, nearly equally 4-lobed, scarcely longer than the calyx. Stamens 2. distant. Achenia 4, smooth, with thickened margins.—*Low perennial herbs, with sharply toothed or pinnatifid leaves, and dense axillary whorls of small white flowers.*

1. L. Virginicus, L. *Bugle-weed.*

Smooth; *stem* stoloniferous at base, smoothish, obtuse 4-angled; *leaves* oblong or ovate-lanceolate, toothed, entire towards the base, short-petioled; *calyx-teeth* 4, ovate blunt.

Shady moist places, common. Aug. *Plant* often purplish. *Stem* 10 to 15 inches high, often purplish, simple or sparingly branched. *Leaves* opposite, *Flowers* white in minute capitate clusters.

2. L. sinuatus, Ell. *Water Horehound.*

Stem erect, sharply 4 angled; *leaves* oblong-lanceolate, narrowed at both ends, peticled, the *lower ones* pinnatifid, the others sinuate toothed, or the uppermost linear and nearly entire; *calyx-teeth* 5, spiny-pointed.

Low grounds, common. July, Aug. Smoothish. *Stem* 1 to 2 feet high. *Flowers* in dense whorls, white, larger than the last.

4. ORIGANUM, Linn. Marjoram.

Gr. *oros*, a mountain, and *ganos*, delight.

Calyx ovoid-tubular, 5-toothed. Corolla somewhat 2-lipped; *upper lip* erect, nearly flat, slightly notched; *lower* of 3 nearly equal spreading lobes; *tube* about as long as the calyx. Stamens 4, exserted, somewhat didynamous.—*Herbs with nearly entire leaves, and purplish flowers crowded in cylindrical or oblong spikes which are imbricated with colored bracts.*

1. O. vulgare, L. *Wild Marjoram.*

Perenniel, upright, hairy, branched at the summit; *leaves* round-ovate, petioled, obtuse, nearly entire; *bracts* ovate, obtuse, longer than the calyx; *spikes* roundish, panicled, clustered, smooth.

Rocky fields and dry banks, sparingly naturalized. June—Oct. *Stem* 10 to 15 inches high, purple. *Leaves* very slightly serrate, opposite. sprinkled with resinous dots. *Bracts* tinged with purple. *Flowers* pale-purple, in numerous small spikes which are crowded together so as to form a terminal head.

2. O. Marjorana, Ph. *Sweet Marjoram.*

Leaves oval or obovate, obtuse, entire, petiolate, hoary-pubescent; *spikes* roundish, compact, pedunculate, clustered at the ends of the branches; *bracts* roundish. Native of Portugal. A perennial plant, cultivated in gardens for its pleasant aromatic flavor, which is employed in various ways as a seasoning. Whole plant soft downy, 1 foot high. *Flowers* pink. July, Aug.

5. COLLINSONIA, Linn. HORSE-BALM.

In honor of *Peter Collins*, of London, a patron of botany.

CALYX ovate, about 10-nerved, 2-lipped; *upper lip* 3-toothed, truncate; *lower* 2-toothed. COROLLA elongated, expanded at the throat, somewhat 2-lipped, with the 4 upper lobes nearly equal, the lower larger and longer, toothed or lacerate-fringed. STAMENS mostly 2, much exserted, diverging.—*Strongly-scented perennials, with large ovate leaves, and yellowish flowers on slender pedicels in loose and panicled terminal racemes.*

C. CANADENSIS, L. *Common Horse-Balm. Stone-root.*

Nearly smooth; *leaves* broadly ovate, serrate, pointed, petioled; *panicle* loose, many-flowered; *stamens* 2.

Rich moist woods, common. July—Sept. *Stem* 1 to 3 feet high, somewhat branched, 4-angled. *Leaves* thin, 6 to 8 inches long, and 3 to 4 inches wide. *Flowers* large, greenish-yellow, exhaling the odor of lemons.

6. HEDEOMA, Persoon. PENNYROYEL.

A Greek name for Mint, alluding to its agreeable odor.

CALYX ovoid-tubular, gibbous on the lower side near the base, 2-lipped; *upper lip* 3-toothed; *lower lip* 2-cleft. COROLLA 2-lipped; *upper lip* erect, flat, notched at the apex; *lower* spreading, 3-cleft, the lobes nearly equal. STAMENS 2, fertile and ascending, 2 lower, sterile filaments or wanting.—*Low aromatic plants, with small leaves, and loose axillary clusters of pale blue flowers, somewhat approximated in terminal leafy racemes.*

H. PULEGIOIDES, Pers. *American Pennyroyel.*

Stem erect, branched, pubescent; *leaves* ovate or elongated, obscurely serrate, narrowed at the base, petioled; *whorls* about 6-flowered; *corolla* about as long as the calyx.

Open barren woods and dry fields, common. July—Sept. *Plant* 6 to 10 inches high, branched above. *Leaves* opposite, with 1 to 2 teeth on each side. *Flowers* small, pale-blue, about 3 in each opposite axil. A popular domestic medicinal herb.

7. CUNILA, Linn. DITTANY.

An ancient Latin name of unknown origin.

CALYX ovoid-tubular, equally 5-toothed, hairy in the throat, about 13-nerved. COROLLA 2-lipped; *upper lip* erect, flattish, mostly notched; *lower lip* 3-lobed, spreading. STAMENS 2, erect, exserted, distant. STYLE 2-parted at the summit.—*Perennial herbs, with small white or purplish flowers in corymbed cymes or close clusters.*

C. Mariana, L. *Common Dittany.*

Stems tufted, corymbosely branched; *leaves* ovate, serrate, smooth, rounded or heart-shaped at the base, nearly sessile; *cymes* peduncled, loosely corymbed.

Dry hills and rocks; common. July—Sept. *Plant* 1 foot high, sprinkled with resinous and pellucid dots, much branched; *branches* triangled, purple. *Flowers* rose-colored. *Stamens* and *style* much exserted, of the same hue as the corolla. Whole plant delightfully fragrant, often used as a substitute for tea.

8. BLEPHILIA, Raf.

Gr. *blepharis*, the eye-lash; in reference to the hairy-fringed bracts and calyx-teeth.

Calyx ovoid-tubular, 13-nerved, 2-lipped, naked in the throat. Corolla 2-lipped, inflated in the throat; *upper lip* erect, entire; *lower lip* spreading, 3-cleft, with the lateral lobes ovate and rounded. Stamens 2, ascending, exserted.—*Perennial herbs, with entire or toothed leaves, and small pale bluish-purple flowers, crowded in axillary and terminal globose capitate whorls.*

1. B. ciliata, Raf. *Fringed Blephilia.*

Somewhat downy; *leaves* nearly sessile, oblong-ovate, narrowed at the base. whitish downy underneath; *outer bracts* ovate, acute, ciliate, colored as long as the calyx.

Dry open places. July. *Stem* simple, acutely 4-angled, 2 to 3 feet high. rarely with 1 or 2 spreading branches. *Leaves* 1 to 2½ inches long, ½ to 1 inch wide. *Flowers* small, numerous, pale purplish.

2. B. hirsuta, Benth. *Hairy Blephilia.*

Whole plant hairy; *leaves* long-petioled, ovate, pointed, rounded or heart-shaped at the base; *bracts* colored, linear-awl-shaped, shorter than the calyx.

Damp woods; rare. July. *Stem* 2 to 3 feet high, with spreading branches, and numerous close whorls. *Leaves* 1 to 2 inches long, on petioles ¼ to ½ inch long. *Corolla* scarcely ½ inch long, pale purple, with spots of a deeper hue. *Style* longer than the stamens and corolla.

9. MONARDA, Linn. Horsemint.

In honor of *Monardez*, an early Spanish botanist.

Calyx tubular, elongated, 15-nerved, nearly equal, 5-toothed. Corolla ringent, with a long cylindric tube, *upper lip* spreading, 3-lobed at the apex, the middle lobe longer. Stamens 2, exserted from the upper lip of the corolla.—*Odorous erect herbs, with entire or toothed leaves, and showy large flowers in a few capitate whorls closely surrounded with bracts.*

1. M. didyma, L. *Oswego Tea. Burgamot.*

Somewhat hairy; *stems* acutely 4-angled; *leaves* broadly ovate acuminate, rounded or slightly heart-shaped at the base, short petioled; *calyx* smooth, incurved. nearly naked in the throat; *corolla* smooth, much elongated. Per.

Moist woods and meadows; cultivated. July. A handsome fragrant plant. 2 to 3 feet high, mostly branched *Leaves* 2 to 5 inches long, very broad at base, serrate, with scattered hairs above. *Flowers* crimson or scarlet, in heads, often proliferous with large ovate-lanceolate bracts, tinged with red. *Corolla* 2 inches long;

2. M. FISTULOSA, L. *Wild Burgamot.*

Smoothish or downy; *leaves* ovate-lanceolate, rounded and somewhat cordate at base, acuminate, coarsely toothed; *floral leaves* and outer bracts slightly colored; *calyx* slightly curved, very hairy in the throat. Per.

Woods and rocky banks; common. July—Sept. A very variable plant 2 to 5 feet high, embracing several nominal species and varieties. *Stem* quadrangular, with the sides somewhat concave. *Leaves* 2 to 4 inches long on petioles ½ to ¾ inch long. *Flowers* purplish, rose-color or nearly white.

3. M. PUNCTATA, L. *Horsemint.*

Minutely downy; *leaves* lanceolate, narrowed at the base, petioled; *bracts* lanceolate, obtuse at the base, sessile; *calyx-teeth* short and rigid, awnless; *corolla* nearly smooth, the tube scarcely exceeding the calyx.

Sandy fields and dry banks. Aug., Sept. *Stem* 2 to 3 feet high, branched. *Leaves* punctate. *Bracts* yellowish and purple. *Corolla* yellowish the upper lip spotted with purple. The whole plant is very odorous and pungent to the taste.

10. SALVIA, Linn. SAGE.

Lat. *salvo*, to save; in allusion to its reputed healing qualities.

CALYX somewhat bell-shaped, 2-lipped; *upper lip* mostly 3-toothed, the *lower* 2-cleft. COROLLA deeply 2-lipped, ringent; *upper lip* erect, straight or falcate and vaulted, entire or barely notched; the *lower lip* spreading or pendent, 3-lobed, the middle lobe longer and sometimes notched. STAMENS 2, on short filaments; CONNECTILE transversely articulated to the filament, supporting at each end a cell of the dimidiate anther. ACHENIA 4.—*A large genus of which but few are indigenous, with usually large and showy, spiked, racemed, or panicled whorls of flowers.*

1. S. LYRATA, L. *Lyre-leaved Sage.*

Somewhat hairy; *stem* nearly simple and naked; *root-leaves* obovate, lyre shaped or sinuate-pinnatifid, sometimes nearly entire; those of the stem mostly a single pair, smaller and narrower, the *floral* oblong-linear; *whorls* of *flowers* loose and distant, forming an interrupted raceme; *upper lip of the corolla* short, straight and vaulted.

Woodlands and meadows. May, June. *Plant* 10 to 12 inches high. *Flowers* in whorls of about 6, distant. *Corolla* blue, the tube much exserted.

2. S. URTICIFOLIA, L. *Nettle-leaved Sage.*

Downy with clammy hairs, leafy; *leaves* rhombic-ovate, pointed, crenate, rounded at base, short-petioled; *whorls* remote, many-flowered; *upper lip of the corolla* erect, much shorter than the lower; *style* bearded.

Woodlands, Western Counties, rare. *Leaves* very pubescent. *Flowers* blue, viscid, in remote whorls. *Corolla* ½ inch long, the lateral lobes deflexed, the middle notched.

CULTIVATED EXOTIC SPECIES.

3. S. OFFICIANALIS, L. *Common Sage.*

Leaves ovate-lanceolate, crenulate, rugose; *whorls* 6 to 10-flowered in 2 opposite ects; *calyx* striate, the divisions pointed; *upper lip of the corolla* as long as the lower, somewhat vaulted. A well known garden plant, cultivated for its medicinal properties. *Stem* 1 to 2 feet high. *Leaves* 1 to 3 inches long, of a dull green color, aromatic. *Corolla* ringent, blue or purplish. Native in the South of Europe.

4. S. Sclarea, L. *Clarry.*

Leaves oblong, heart-shaped, rugose, serrate; *bracts* colored, concave, longer than the calyx. A strong-scented exotic, native of Italy. *Stem* 1 to 3 feet high, with leaves 5 to 7 inches long and 3 to 4 wide, viscid. *Flowers* variagated with pale purple and yellowish-white, in whorled spikes. *Bracts* pale purple or yellowish.

5. S. splendens, Ker. *Spendid Sage.*

Stem erect, smooth; *leaves* broad-ovate and ovate, petiolate, rounded or acute at base, dentate-serrate, acuminate, smooth on both sides; *bracts* deciduous; *calyx* and *corolla* pubescent; *upper lip* entire. A beautiful species, cultivated in gardens; native of Mexico. *Plant* 2 to 4 feet high, branched. *Flowers* large, scarlet. *Calyx* scarlet, after flowering becoming enlarged and as showy as the corolla.

11. CEDRONELLA, Mœnch.

Gr. *kedros*, a diminutive of Cedar; from the aromatic leaves of the original species, C. *triphylla*, the *Balm-of-Gilead* of English gardens.

Calyx somewhat obliquely 5-toothed, many-nerved. Corolla much expanded at the throat, 2-lipped; *upper lip* flattish or concave, 2-lobed, the *lower* 3-cleft, spreading, the middle lobe largest. Stamens 4, ascending, shorter than the upper lip, the lower pair shorter than the other!—*Sweet-scented perennials, with pale purplish flowers.*

C. cordata, Benth. *Creeping Cedronella.*

Low, creeping by slender runners, hairy; *leaves* broadly heart-shaped, crenate, petioled, the floral shorter than the calyx; *whorls* few-flowered, approximate at the summit of short ascending stems.

Low shady banks of streams, western part of the State, rare. June. *Flowers* purplish. *Corolla* hairy inside 1½ inch long. (Dracocephalum cordatum, Nutt.)

12. NEPETA, Linn. Cat-mint.

Supposed to be from *Nepet*, a town in Tuscany.

Calyx tubular, often incurved, obliquely 5-toothed. Corolla naked and dilated in the throat, 2-lipped; *upper lip* erect, notched or 2-cleft, the *lower* spreading, 3-cleft, the middle lobe largest. Stamens 4, ascending under the upper lip, the lower pair shorter.—*Perennial herbs.*

* Cataria, Benth.—*Clusters dense and many-flowered, forming interrupted spikes or racemes.*

1. N. Cataria, L. *Catnip.*

Downy, erect, branched; *leaves* heart shaped, oblong, deeply crenate, petioled, whitish downy underneath; *spiked racemes* somewhat panicled.

Waste and cultivated grounds, a very common naturalized weed. July, Aug. *Stem* square, pubescent, branching, 2 to 3 feet high. *Flowers* numerous, white or purplish, the *lower lip* dotted with crimson.

* * GLECHOMA, L. *Axillary clusters loosely few-flowered.*

2. N. GLECHOMA, Benth. *Ground Ivy.*

Creeping and trailing; *leaves* petioled, round-kidney-shaped, crenate; *corolla* about 3 times as long as the calyx.

Waste grounds, in shaded places, perfectly naturalized. May—Aug. *Stems* prostrate, from a few inches to 1 to 2 feet long. *Flowers* axillary in 3s. *Corolla* bluish-purple, with a variegated throat. *Anthers* with the cells diverging at a right angle, each pair approximate and forming a cross.

13. DRACOCEPHALUM, Linn. DRAGON HEAD.

Gr. *drakon*, a dragon, and *kephale*, head; alluding to the form of the corolla.

CALYX tubular, 13 to 15-nerved, 5-toothed, the upper tooth much largest. COROLLA dilated in the throat, 2-lipped; *upper lip* slightly arched and notched; the *lower* spreading, 3-cleft, with the middle lobe much larger, rounded or 2-cleft. STAMENS 4, ascending under the upper lip.—*Whorls of flowers mostly spiked or capitate, and usually subtended with large conspicuous bracts.*

D. PARVIFLORUM, Nutt. *Small-flowered Dragon-head.*

Sub-pubescent; *stem* erect, somewhat branched, leafy; *leaves* ovate-lanceolate, sharply cut-toothed, petioled; *whorls* crowded in a terminal globular or oblong capitate spike; *bract* leafy, ovate, fringed; biennial.

Rocky places, and gravelly shores, along the Susquehanna. May—Aug. *Stem* 8 to 20 inches high, obtusely 4-angled. *Upper calyx-tooth* nearly as long the corolla. *Corolla* bluish-purple; the *upper lip* arched, emarginate, central lobe of the lower lip crenate.

14. LOPHANTHUS, Benth. GIANT HYSSUP.

Gr. *lophos*, a crest, and *anthos*, a flower.

CALYX tubular-bell-shaped, 15-nerved, oblique, 5-toothed, the upper tooth rather longer than the others. COROLLA 3-lipped; *upper lip* nearly erect, notched; the *lower* somewhat spreading, 3-cleft, with the middle lobe broader and crenate. STAMENS 4, exserted; the upper pair declined; the lower ascending, shortest!—*Perennial upright herbs, with petioled serrate leaves, and small flowers crowded in terminal spikes.*

1. L. NEPETOIDES, Benth. *Yellow Giant Hyssup.*

Smooth or nearly so; *leaves* ovate, somewhat pointed; *calyx-teeth* ovate, rather obtuse, little shorter than the corolla.

Borders of woods. Aug. *Stem* stout, smooth, quadrangular; 4 to 6 feet high. *Leaves* 2 to 4 inches long, coarsely crenate-toothed. *Flowers* small, greenish-yellow, in cylindrical spikes 2 to 4 inches long, crowded with ovate pointed bracts.

2. L. SCROPHULARIÆFOLIUS, Benth. *Purple Giant Hyssup.*

Stem and lower surface of the leaves pubescent; *leaves* ovate, acute, serrate-crenate; *calyx-teeth* lanceolate, acute, shorter than the corolla.

Borders of rich woods. Aug. *Stem* 3 to 5 feet high, mostly of a purple color, branched. *Leaves* often cordate at base, 5 inches long and about 3 inches wide, coarsely-serrate. *Flowers* in crowded, axillary verticels, forming a long, dense, terminal spike. *Corolla* pale purple. *Stamens* and *style* exserted.

15. PYCNANTHEMUM, Michx. MOUNTAIN MINT.

Gr. *puknos*, dense, and *anthemon*, a blossom; from the crowded or capitate flowers

CALYX tubular or ovate-oblong, striate, 5-toothed. COROLLA with a short tube and a somewhat 2-lipped border; *upper lip* entire or slightly notched, the *lower* 3-cleft; *lobes* all ovate and obtuse. STAMENS 4, distant, the lower pair rather longest.—*Perennial aromatic upright herbs, corymbosely branched above, often whitish floral leaves, and dense many-flowered whorls, crowded with bracts, usually forming terminal heads or close cymes, with whitish or flesh-colored flowers.*

1. P. INCANUM, Michx. *Common Mountain Mint.*

Leaves ovate oblong, acute, remotely toothed, rounded at the base, downy above and hoary with whitish wool underneath; *cymes* peduncled, compound, open; *bracts* subulate.

Rocky woods and hills, common. July, Aug. *Stem* 2 to 4 feet high obtusely 4-angled, erect, covered with soft down. *Flowers* pale red or flesh-colored, with purple spots on the lower lip of the corolla.

2. P. MUTICUM, Pers. *Veiny-leaved Mountain Mint.*

Smooth or somewhat hoary throughout, corymbosely branched; *leaves* ovate or broadly ovate-lanceolate, acute, rounded or somewhat heart-shaped at the base, mostly sessile, minutely toothed, rigid; *whorls* dense, mostly in terminal heads; *outer bracts* and ovate-lanceolate *calyx-teeth* hoary with a fine close down.

Dry hills; common. Aug. *Stem* 1 to 2 feet high with widely spreading branches, square. *Leaves* opposite, large, ½ as wide as long. *Flowers* reddish-white, with purple spots, in dense terminal heads which are about ½ inch in diameter.

3. P. LANCEOLATUM, Pursh. *Lance-leaved Mountain Mint.*

Smoothish or minutely downy, corymbosely branched above, very leafy; *leaves* lanceolate or nearly linear, entire, rigid, obtuse at the base, sessile, feather-veined; *bracts* ovate-lanceolate, barely pointed, downy.

Thickets and dry woods; common. July, Aug. *Stem* about 2 feet high, square with obtuse angles. *Leaves* variable in width. *Flowers* small, reddish-white, with purple dots, in numerous small clustered dense heads.

4. P. LINIFOLIUM, Pursh. *Flax-leaved Mountain Mint.*

Smooth, or nearly so; *leaves* narrowly linear, crowded, 3-veined, entire; *bracts* slightly awned; *calyx-teeth* lance-subulate.

Thickets and moist woods. July, Aug. *Stem* erect, 12 to 18 inches high, with fastigiate, trichotomous branches, often purplish. *Leaves* very narrow, punctate, with fascicles of smaller ones in the axils. *Flowers* small, white, in numerous small, roundish heads, mostly terminal.

16. THYMES, Linn. THYME.

The ancient Greek name.

CALYX 2-lipped, hairy in the throat, 13-nerved; *upper lip* 3-toothed, spreading; *lower* 2-cleft. COROLLA short, slightly 2-lipped; *upper lip* straight and flattish, notched at the apex; *lower* spreading, equally 3-cleft, or the middle lobe longest. STAMENS 4, mostly exserted.—*Low mostly prostrate and diffuse perennials, with small entire veiny leaves, and purplish or whitish flowers.*

1. T. SERPYLLUM, L. *Garden Thyme.*

Stem procumbent; *leaves* flat, ovate, obtuse, entire, short-petioled, more or less ciliate; *flowers* approximate at the end of the branches in an oblong head.

Old fields, escaped from cultivation and sparingly naturalized. July. *Stem* spreading, decumbent, branched. *Leaves* green, more or less hairy. *Flowers* purple, spotted.

17. CLINOPODIUM, Linn. BASIL.

Gr. *kline*, a bed, and *pous*, a foot; from the stalked and flattened head of flowers.

CALYX tubular, 13-nerved, nearly equal at the base, hairy in the throat, more or less 2-lipped; *upper lip* 3-cleft, the *lower* 2-cleft. COROLLA inflated in the throat, distinctly 2-lipped; *upper lip* erect, entire; *lower* spreading, 3-parted STAMENS 4, ascending.—*Perennials, with many-flowered capitate whorls of purplish flowers, and numerous linear-awl-shaped exterior bracts forming a sort of involucre.*

C. VULGARE, L. *Wild Basil.*

Erect, hairy; *leaves* ovate, petioled, slightly toothed; *whorls* many-flowered, depressed-globose: *calyx* curved; *bracts* subulate as long as the calyx.

Hills and old fields; naturalized. July. *Stem* 1 to 2 feet high, square, simple or sparingly branched, and, as well as the whole plant clothed with a whitish wool. *Flowers* pale purple.

18. MELISSA, Linn. BALM.

Gr. *melissa*, a bee; the flowers yielding an abundance of honey.

CALYX slightly gibbous at the base, 2-lipped; *upper lip* 3-toothed; *lower* 3-cleft. COROLLA with a recurved-ascending tube, 2-lipped; *upper lip* erect, flattish; *lower* spreading, 3-lobed; the middle lobe mostly broader. STAMENS 4, ascending, mostly approximate in pairs at the summit.—*Perennials, with few-flowered, loose, one-sided clusters of white or cream-colored flowers, and few mostly ovate bracts resembling the leaves.*

M. OFFICINALIS, L. *Common Balm.*

Upright, branching; *leaves* broadly ovate, crenate-toothed, petioled, more or less hairy; *whorls* dimidiate or secund, loose, axillary.

Escaped from gardens, partially naturalized. Aug. *Stem* 1 to 2 feet high, more or less pubescent. *Flowers* white or cream-color. *Plant* exhaling the odor of lemons.

19. PRUNELLA, Linn. SELF-HEAL.

CALYX tubular-bell-shaped, 2-lipped; *upper lip* broad and flat, truncate, with 3 short teeth; *lower* 2-cleft. COROLLA 2-lipped; *upper lip* erect, arched, entire; *lower* reflexed-spreading, 3-cleft; the lateral lobes oblong, the middle one rounded, concave, finely toothed. STAMENS 4, ascending under the upper lip; *filaments* 2-toothed at the apex, the lower tooth bearing the anther.—*Low perennials, with nearly simple stems, and 6-flowered clusters of violet or flesh-colored flowers sessile in the axils of rounded and bract-like floral leaves, imbricated in a capitate spike.*

P. VULGARIS, L. *Common Self-heal. Heal-all.*

Leaves ovate-oblong, entire or toothed, petioled, hairy or smoothish; *corolla* nearly twice as long as the calyx.

Woods and fields, common. Aug. *Plant* 10 to 15 inches high, erect or ascending, somewhat branched, hairy. *Flowers* large, purple. *Floral leaves* concave, short-pointed, tinged with purple.

20. SCUTELLARIA, Linn. SKULLCAP.

Lat. *scutella*, a dish, in allusion to the form of the calyx.

CALYX bell-shaped, gibbous, 2-lipped; the lips entire; *upper one* with a winged appendage on the back, deciduous after flowering. COROLLA 2-lipped, with an elongated tube, dilated at the throat; *upper lip* arched, entire or nearly so, *lower* dilated, convex. STAMENS 4, ascending under the upper lip; *anthers* approximate in pairs.—*Bitter perennial herbs, with axillary spiked or racemed flowers; the short peduncles opposite,* 1-*flowered, often* 1-*sided.*

* *Flowers axillary, solitary.*

1. S. GALERICULATA, L. *Common Skullcap.*

Smooth or somewhat downy, mostly branching; *leaves* ovate-lanceolate, acute, serrate, roundish and slightly cordate at base, short-petioled; *flowers* on short pedicels.

Wet shady places, common. Aug. *Stem* square, 12 to 18 inches high. *Leaves* 1½ inch long, and ½ wide, on very short petioles. *Flowers* blue, pubescent, ½ to 1 inch long.

2. S. NERVOSA, Pursh. *Nerved Skullcap.*

Smooth, simple or branched, slender; *lowest leaves* roundish, petioled; *middle ones* ovate, toothed, somewhat heart-shaped, sessile; *upper floral* ovate-lanceolate, entire; *flowers* small, opposite.

Moist thickets. June. *Stem* 10 to 15 inches high, weak, often with a few filiform branches. *Leaves* about 1 inch long, ½ as wide, with 3 to 5 prominent veins underneath, thin. *Flowers* small, pale-blue.

3. S. PARVULA, Michx. *Small Skullcap.*

Minutely downy, dwarf, branched and spreading; *lowest leaves* round-ovate, short-petioled, the others sessile ovate or lance-ovate, obtuse, all entire or nearly so; *flowers* small, axillary.

Dry banks and fields. May, June. *Stem* 3 to 6 inches high, simple or branched from near the base and spreading, mostly purplish. *Leaves* ⅓ to ¾ inch long, sessile, distinctly veined, purplish beneath. *Flowers* ¼ to ½ inch long, blue, hairy.

* * *Flowers in axillary and terminal racemes.*

4. S. LATERIFLORA, L. *Mad-dog Skullcap.*

Smooth; *stem* upright, much branched; *leaves* lance-ovate or ovate-oblong, pointed, coarsely serrate, rounded at the base, petioled, upper *floral leaves* scarcely longer than the calyx; *flowers* small, in lateral racemes.

Wet shaded places, common. Aug. *Stem* square, 1 to 2 feet high, very branching. *Leaves* opposite, 2 to 3 inches long, on petioles 1 inch long. *Racemes* opposite, axillary, somewhat 1-sided, on long stalks. *Flowers* small, blue, ¼ inch long, the upper lip scarcely arched. This plant was in great repute some years ago as a cure for hydrophobia.

5. S. PILOSA, Michx. *Hairy Skullcap.*

Stem erect, mostly simple, hairy; *leaves* remote, rhombic-ovate, crenate, obtuse, more or less hairy; the *lowest* rounded and often heart-shaped; the others wedge-shaped at the base; *upper floral* spatulate, shorter than the hairy calyx; *raceme*, terminal, short.

Open dry woods. June, July. *Stem* 12 to 18 inches high, often purplish. *Leaves* few 1 to 2½ inches long, ½ as wide, on petioles 1 inch long. *Raceme* mostly simple, few-flowered, with opposite elliptical bracts. *Corolla tube* nearly white below, blue at the summit, ½ to ¾ inch long.

6. S. CANESCENS, Nutt. *Canescent Skullcap.*

Stem tall, branched, pubescent; *leaves* ovate or ovate-lanceolate, serrate, crenate, the *upper* narrowed, but the *lower* rounded or slightly heart-shaped at the base, nearly smooth above, white downy beneath; *flowers* in loose paniculate racemes.

Dry open woods and meadows. July. *Stem* 2 to 3 feet high, erect, mostly purple. *Leaves* 2 to 3 inches long, 1 to 2 wide, often with a purple margin and purple spots. *Flowers* rather numerous, ¾ inch long, deep blue, showy, in lateral and terminal racemes.

7. S. INTEGRIFOLIA, L. *Entire-leaved Skullcap.*

Whole plant downy with a minute hoariness; *stem* upright, nearly simple; *leaves* oblong-lanceolate or linear, mostly entire, obtuse, remote, the *upper* on very short petioles; *raceme* often branched, leafy; *bracts* lanceolate.

Moist open grounds. June, July. *Stem* 1 to 2 feet high, sparingly branched above, grayish-green. *Leaves* 1 to 2 inches long, variable in width. *Corolla* ¾ to 1 inch long, bright blue at the summit, nearly white at the base.

8. S. SERRATA, Andrews. *Serrate Skullcap.*

Rather slender, upright; *leaves* ovate, serrate, acute or pointed at both ends, all tapering into the petiole, green and nearly smooth on both sides; the *floral* lanceolate, the *upper* shorter than the slightly hairy calyx; *raceme* mostly simple, loose, leafy at the base; *upper lip* of the corolla incurved.

Woods, Southern parts of the State. July. *Stem* 2 to 3 feet high, smooth. *Leaves* 2 to 3 inches long. *Flowers* deep blue, ⅔ inch long.

21. PHYSOSTEGIA, Benth. FALSE DRAGON-HEAD.

Gr. *phusa*, a bladder, and *stego*, to cover; on account of the inflated calyx and corolla.

CALYX nearly equally 5-toothed, obscurely 10-nerved, after flowering inflated-bell-shaped. COROLLA 2-lipped, with a much exserted long tube and inflated throat; *upper lip* nearly erect, somewhat concave; *lower lip* spreading, 3-lobed, the lateral lobes small, the middle broad and rounded. STAMENS 4, ascending under the upper lip; ANTHERS approximate.—*Perennial smooth herbs, with upright slender stems, sessile leaves, and large showy flesh colored and purplish flowers, opposite, in simple or panicled terminal leafless, crowded spikes.*

P. VIRGINIANA, Benth. *Lion's-heart. Dragon-head.*

Leaves varying from lance-linear to ovate-lanceolate, serrate; *calyx* acutely and almost equally 5-toothed; *bracts* shorter than the calyx, ovate, pointed.

Moist places, along rivers. July, Aug. *Stem* variable in height, 1 to 4 feet high. *Leaves* opposite, closely sessile, 4 to 5 inches long, ⅝ inch wide, with remote shallow teeth, of a shining dark green. *Flowers* in 4-rowed spikes, large pale purple, about 1 inch long, spotted inside.

22. LAMIUM, Linn. DEAD-NETTLE.

Gr. *laimos*, the throat; in allusion to the ringent corolla.

CALYX tubular-bell-shaped, about 5-nerved, with 5 nearly equal serulate teeth. COROLLA dilated at the throat; *upper lip* ovate or oblong, arched, narrowed at the base; *lower lip* with the middle lobe broad, notched at the apex, contracted at base. STAMENS 4, ascending under the upper lip; ANTHERS approximate in pairs,—*Herbs, decumbent at base, with the lowest leaves small and long-petioled, the middle ones cordate and doubly toothed, the floral nearly sessile, and axillary whorled clusters of purplish flowers.*

L. AMPLEXICAULE, L. *Common Dead-Nettle. Hen-bit.*

Leaves rounded, deeply crenate-toothed or entire, the upper clasping; *lower whorls* remote, the upper crowded; *corolla* elongated, the upper lip bearded, the lower spotted; *lateral lobes* truncate.

Waste and cultivated grounds, introduced. Biennial. May—Nov. A small slender herb, with ascending stems, several from the same root, 6 to 10 inches high, with opposite, short, broad hairy leaves. *Flowers* in dense whorls, purple, downy; *corolla-tube* much exserted, the lower lip spotted with white.

23. LEONURUS, Linn. MOTHERWORT.

Gr. *leon*, a lion, and *oura*, a tail, i. e. *Lion's-tail.*

CALYX top-shaped, 5-nerved, with nearly equal subulate teeth. COROLLA 2-lipped; *upper lip* oblong, entire, somewhat arched; *lower lip* spreading, 3-lobed, the middle lobe larger, broad and inversely heart-shaped, the lateral oblong. STAMENS 4, ascending under the upper lip; ANTHERS approximate in pairs.—*Upright herbs, with cut-lobed leaves, and close whorls of pale purple flowers in their axils.*

L. CARDIACA, L. *Common Motherwort.*

Somewhat hairy, tall; *leaves* long-petioled; the *lower* rounded, palmately lobed; the *floral* wedge-shaped at the base, 3-cleft, the lobes lanceolate; *upper lip of* corolla bearded.

Waste places, around houses, naturalized. July—Sept. Per. *Stem* 2 to 3 feet high, branched, villous. *Leaves* pubescent, pale beneath. *Flowers* in many whorls, white or with a reddish tinge. *Corolla* hairy without, variegated within.

24. GALEOPSIS, Linn. HEMP-NETTLE.

Gr. *galea*, a weasel, and *opsis*, resemblance; from some resemblance of the corolla to the head of the weasel.

CALYX tubular-bell-shaped, about 5-nerved, 5-toothed, equal and spiny tipped. COROLLA 2-lipped, dilated at the throat; *upper lip* ovate, arched, entire; *lower lip* 3-cleft, spreading, the middle lobe ob-cordate, the lateral lobes ovate; the palate with 2 teeth at the sinuses. STAMENS 4, ascending under the upper lip.—*Annuals or biennials, with spreading branches and several to many flowered whorls in the axils of the floral leaves.*

G. TETRAHIT, L. *Common Hemp-Nettle.*

Stem swollen below the joints, bristly-hairy; *leaves* ovate, coarsely serrate; *corolla* 2 to 3 or 4 times the length of the calyx.

Waste places, naturalized, rather common. July. *Stem* 1 to 2 feet high, retrorsely hisped, branched. *Flowers* numerous, pale purple, with darker spots, in dense whorls.

25. STACHYS, Linn. HEDGE-NETTLE.

Gr. *stachys*, a spike: in allusion to its mode of flowering.

CALYX tubular-bell-shaped, 5 to 10-nerved, equally 5-toothed, or the upper ones longer. COROLLA 2-lipped; *upper lip* erect or spreading, often arched, entire or nearly so; *lower lip* usually longer and spreading, 3-lobed, the middle lobe largest. STAMENS 4, ascending under the upper lip; ANTHERS approximated in pairs.—*Mostly perennial herbs, with 2 to many-flowered whorls, approximated in terminal racemes or spikes.*

1. S. ASPERA, Michx. *Rough Hedge-Nettle.*

Stem erect, angles hairy backwards; *leaves* ovate-oblong or oblong-lanceolate, acute, serrate, rounded at the base, bristly on the midrib and veins, short-petioled; *calyx* bristly; *whorls* about 6-flowered.

Wet banks and thickets. June—Aug. Per. *Plant* 2 feet high, sparingly branched. *Flowers* in loose whorls of 4 to 8, forming a terminal leafy spike, pale purple.

2. S. PALUSTRIS, L. *Marsh Hedge-Nettle.*

Stem softly pubescent, or smooth below; *leaves* oblong-lanceolate, crenate-toothed, rounded or heart-shaped at the base, rugose, hairy, nearly sessile; *whorls* 6 to 10-flowered; *calyx* smooth, the teeth lanceolate, acute and somewhat spiny.

Wet places. July, Aug. Per. *Stem* 2 to 3 feet high, branched. *Flowers* purplish, in whorls, forming a long terminal spike.

3. S. HYSSOPIFOLIA, Michx. *Smooth Hedge-Nettle.*

Smooth or nearly so; *leaves* linear-oblong, sessile, obscurely toothed towards the apex; *whorls* 4 to 6-flowered; *calyx* smooth, lanceolate, acute; *corolla* twice or thrice the length of the calyx.

Wet sandy places. July. Per. *Stem* slender, ascending, 9 to 12 inches high. *Leaves* often linear, very finely toothed. *Flowers* purple, sessile in whorls near the summit of the stem.

26. MARRUBIUM, Linn. HOREHOUND.

A name of Pliny, said to be derived from the Hebrew *marrob*, a bitter juice.

CALYX tubular, 5 to 10-nerved, nearly equally 5 to 10-toothed; *throat* hairy. COROLLA 2-lipped; *upper lip* erect, flattish, notched; *lower lip* spreading, 3-cleft, the middle lobe broadest. STAMENS 4, included in the tube of the corolla.—*Whitish-woolly bitter perennial herbs, with rugose and crenate or cut leaves, and whitish flowers.*

M. VULGARE, L. *Common Horehound.*

Stems ascending; *leaves* round-ovate, crenate-toothed, petioled; *flowers* in distant and dense capitate whorls; *calyx* with 10 recurved teeth, the alternate ones shorter.

Roadsides and waste places, common, naturalized. July, Aug. *Stem* 12 to 18 inches high, branched from the base, covered with a white wool. *Flowers* small, white, in crowded whorls. An aromatic bitter herb, much used as a domestic medicine. Native of Europe.

27. TRICHOSTEMA, Linn. BLUE CURLS.

Gr. *thrix*, *trikos*, a hair, and *stema*, stamen; in allusion to the hair-like stamens.

CALYX bell-shaped, oblique, deeply 5-cleft; the 3 upper teeth elongated, the 2 lower short. COROLLA 5-lobed; the lobes oblong, declined; the 3 lower more or less united. STAMENS 4, much exserted beyond the corolla, declined and than turned upwards.—*Low somewhat clammy pubescent annuals, with entire leaves, and mostly blue flowers on solitary 1-flowered pedicels terminating the branches.*

T. DICHOTOMA, L. *Bastard Pennyroyel.*

Stem pubescent; *leaves* lance-oblong or rhombic lonceolate, rarely lance-linear, petiolate, entire; *flowers* inverted; *stamens* very long, exserted.

Sandy fields and roadsides, common. July—Sept. *Stem* 10 to 12 inches high, obtusely 4-angled, bushy. *Flowers* axillary and terminal, becoming inverted by the twisting of the petiole, purple. *Stamens* slender, curved from the lower lip of the corolla to the upper, forming a beautiful arch.

28. TEUCRIUM, Linn. GERMANDER.

Named for *Teucer*, king of Troy.

CALYX equally 5-toothed, or the upper tooth larger. COROLLA 5-lobed; the 4 *upper lobes* nearly equal, oblong, declined; the *lower one* large. STAMENS 4, exserted from the cleft between the two upper lobes of the corolla. ACHENIA wrinkled.—*A herbaceous downy perennial, with white or purple flowers.*

T. CANADENSE, L. *Wild Germander. Wood Sage.*

Hoary-pubescent; *leaves* ovate-lanceolate, serrate, rounded at the base, short-petioled; the floral scarcely longer than the calyx; *whorls* about 6-flowered, crowded in a single terminal spike; *calyx* bell-shaped, with the 3 upper teeth broader.

Fields and roadsides, not rare. July. *Stem* 1 to 3 feet high, simple, erect, square with concave sides. *Leaves* 3 times as long as wide, green above, hoary beneath. *Bracts* longer than the calyx. *Corolla* purple, rarely white, apparently without the upper lip, instead of which is a fissure through which the stamens are exserted.

CULTIVATED EXOTICS.

29. OCYMUM, Linn. BASIL.

Gr. *osa*, to smell; on account of the powerful scent of the plants.

CALYX 2-lipped; *upper lip* orbicular; *lower* 4-cleft. COROLLA inverted or sub-bilabiate; the 4 *upper lobes* nearly equal, the lower one declinate, undivided, flat or concave, carinate or saccate. STAMENS 4, declined; *exterior filaments* with a process at their base.

O. BASILICUM, L. *Royal Ocymum. Sweet Basil.*

Leaves smooth, ovate-oblong, subdentate, petiolate; *calyx* fringed. An exotic annual from Persia, cultivated for its delightful odor. *Stem* about a foot high, branched, retrorsely pubescent above. *Leaves* smooth and soft, variously colored. *Flowers* white, in simple terminal racemes.

30. LAVENDULA, Linn. LAVENDER.

Lat. *lavare*, to wash; the distilled water of this plant being used as a cosmetic.

CALYX tubular, nearly equal, 13 or rarely 15-ribbed, with 5 short teeth, the upper one often largest. COROLLA 2-lipped; *upper lip* 2-lobed; *lower* 3-lobed. STAMENS 4, declined; *filaments* smooth, distinct, not toothed.—*A small genus of oderiferous shrubby plants, with narrow rigid leaves, and small white flowers.*

L. SPICA, L. *Common Lavender.*

Leaves linear-lanceolate, tapering to the base, sessile, revolute at the edge, the upper ones linear-lanceolate; *spikes* interrupted; *bracts* awl-shaped. Native in the South of Europe. A perennial aromatic plant, exhaling a delightful fragrance, 12 to 18 inches high, branching from the base. *Leaves* crowded at the base of the branches, clothed with a whitish down. *Corolla* pale-lilac, much exserted. July

31. ROSEMARINUS, Linn. ROSEMARY.

An ancient Latin name; *ros*, dew, and *marinus*, of the sea.

CALYX ovate-bell-shaped, 2-lipped; *upper lip* entire, *lower* 2-parted. COROLLA bilabiate; *upper lip* 2-parted; *lower lip* reflexed, 3-lobed, the middle lobe largest. STAMENS 2, ascending, inferior, exserted; *filaments* toothed at base. *Upper lobe* of the style very short; *stigmas* minute, terminal.—*An erect evergreen shrub, with opposite leaves, and bright blue axillary and terminal flowers.*

R. OFFICINALIS, L. *Rosemary.*

Leaves sessile, linear, smooth, with revolute margins; *flowers* peduncled. Native of South Europe. *Leaves* dark green and shining above, downy and sometimes whitish beneath. *Flowers* bright blue, having like the leaves a strong aromatic fragrance like camphor.

32. SATUREJA, Linn. SAVORY.

Arabic *satur*, the general name for labiate plants.

CALYX 5-toothed, tubular, 10-ribbed. COROLLA bilabiate, with the segments nearly equal. STAMENS 2 to 4 diverging, scarcely exserted.—*A cultivated perennial, with numerous small narrow leaves, and axillary cymes of pink-colored flowers.*

S. HORTENSIS, L. *Summer Savory.*

Stem branching; *leaves* linear-oblong, entire, acute at the ends; *peduncles* axillary, cymose. Native of Italy. Cultivated as a culinary aromatic. *Stem* bushy, 1 to 1½ feet high, woody at base, often purple. *Calyx* about as long as the corolla *Corolla* pink-colored. July, Aug.

33. HYSSOPUS, Linn. HYSSOP.

Hebrew *ezob;* Arabic *azzof;* English *hyssop.*

CALYX 5-toothed. COROLLA 2-lipped; *upper lip* erect, flat, emarginate, *lower lip* 3-parted, the middle segment largest, the tube about as long as the calyx. STAMENS 2 to 4, exserted, diverging.—*A showy perennial, with delicate foliage, and bright blue flowers in one sided verticels.*

H. OFFICINALIS, L. *Common Hyssop.*

Leaves linear-lanceolate, acute, entire, sessile; *calyx-teeth* erect, middle division of the corolla 2-lobed, entire. Native of South Europe; cultivated for its reputed medicinal properties. *Plant* 2 feet high, tufted. *Flowers* bright blue, appearing in July.

ORDER 75. BORAGINACEÆ.—*Borage Family.*

Herbs, chiefly rough-hairy, with alternate entire leaves, and symetrical flowers with a 5-parted calyx, a regular 5-lobed corolla, 5 stamens inserted on its tube, and a deeply 4-lobed ovary which forms in fruit 4 seed-like nutlets surrounding the base of the single seed. FLOWERS axillary, or mostly in one-sided racemes or spikes which are revolute (circinate) before expansion, and often bractless.

1. ECHIUM, Tourn. VIPER'S BUGLOSS.

Gr. *echio*, a viper; from the spotted stem of some species.

CALYX 5-parted; *segments* subulate, erect. COROLLA bell-shaped or funnel-form, with an unequally spreading 5-lobed border; *lobes* rounded, *throat* expanded, naked. STAMENS 5, mostly exserted, unequal. STYLE filiform. ACHENIA tuberculate, imperforate.—*Herbs or shrubs, with entire leaves and irregular cyanic flowers, in spicate panicled racemes.*

E. VULGARE, L. *Viper's Bugloss. Blue-weed.*

Rough-bristly; *stem* erect, mostly simple; *stem-leaves* linear-lanceolate, sessile; *spikes* lateral, hairy, deflected; *corolla-tube* shorter than the calyx.

Roadsides and meadows, rare, introduced. June. Biennial. *Stem* 18 to 20 inches high. *Leaves* 2 to 6 inches long, and ¼ to 1 inch wide, *upper ones* clasping, entire, dull green. *Flowers* in short lateral spikes, at first spreading, than erect, disposed in a long and narrow raceme; *corolla* reddish-purple changing to violet-blue.

2. LYCOPSIS, Linn. BUGLOSS.

Gr. *lucos*, a wolf, and *opsis*, appearance.

COROLLA funnel-form, with a curved tube; the *throat* closed with 5 convex obtuse bristly scales placed opposite the lobes. STAMENS 5, and with the style included. ACHENIA rough-wrinkled, concave (perforate) at the base.—*Annual herbs, with blue flowers, distinguished from Anchusa only by the curved corolla tube.*

L. ARVENSIS, L. *Small Bugloss.*

Very rough-bristly; *leaves* lanceolate, obscurely toothed, the upper partly clasping; *flowers* in leafy racemes; *calyx* as long (or nearly as long) as the tube of the corolla.

Dry or sandy fields and roadsides, sparingly naturalized. June. July. *Stem* 1 foot high, erect, branching, roundish. *Leaves* 5 or 6 times as long as wide. *Flowers* small. *Corolla* sky-blue with white scales within.

3. SYMPHYTUM, Tourn. COMFREY.

Gr. *sumphein*, to grow together; probably in allusion to its reputed healing virtues.

CALYX 5-parted. COROLLA oblong-tubular, inflated above, 5-toothed, the throat closed with 5 converging linear-subulate scales. STAMENS included; ANTHERS elongated. STYLE filiform. Achenia smooth, ovate, fixed by a large perforate base.—*Coarse perennial herbs, with thick mucilaginous roots, and one-sided nodding racemes, single or in pairs.*

S. officinale, L. *Common Comfrey.*

Hairy; *stem* branched, winged above by the decurrent leaves, *lower* ovate-lanceolate, petiolate, *upper* and *floral* lanceolate; *sepals* lanceolate; *corolla limb* with 5 recurved teeth.

Moist places, naturalized, cultivated in gardens. June. Whole plant rough with dense hairs. *Stem* 2 to 3 feet high, bearing terminal revolute racemes of white and pink flowers appearing all summer. *Root* medicinal.

4. ONOSMODIUM, Michx. False Gromwell.

So called from its near resemblance to the genus *Onosma*.

Calyx deeply 5-parted, with linear segments. Corolla oblong-tubular, with 5 erect lobes, naked in the throat; *segments* converging. Anthers included, nearly sessile, sagittate. Style much exserted, smooth. Achenia ovoid, smooth and shining, fixed by a flat base.—*Perennial herbs, with oblong sessile nerved leaves, and yellowish-white flowers in terminal and one sided erect, leafy bracted spiked racemes.*

1. O. Virginianum, DC. *Virginian Onosmodium.*

Clothed with harsh appressed bristles; *leaves* oblong or oblong-lanceolate, the lower narrowed at the base; *calyx-lobes* lanceolate, half as long as the corolla, bearded with long bristles outside. (Lithospermum Virginianum, L.)

Banks and hillsides. June—Aug. A very rough erect plant about 18 inches high. *Leaves* 1 to 2½ inches long, ½ to ¾ inch wide, 3 to 5 veined. *Flowers* greenish-white, in leafy racemes, which are recurved at first, at length erect.

2. O. Carolinanum, DC. *Carolina Onosmodium.*

Clothed with long spreading bristly hairs; *leaves* ovate-lanceolate or oblong-lanceolate, acute; *corolla* twice as long as the calyx, with deltoid-ovate lobes; *calyx lobes* lanceolate; *anthers* oblong, longer than the narrow filaments.

River banks and Rocky hills. June. July. *Stem* stout, upright, 3 to 4 feet high. *Leaves* 2 to 4 inches long, thickly clothed with long and shaggy hairs. *Corolla-lobes* more or less hairy on the back.

5. LITHOSPERMUM, Tourn. Gromwell.

Gr. *lithos*, a stone, and *sperma*, seed; from the hard or stony seed.

Calyx 5-parted, persistent. Corolla funnel-form, or rarely salver-form, 5-lobed; *lobes* rounded; *throat* open, mostly furnished with 5 small folds or gibbous projections. Stamens included; anthers oblong, nearly sessile. Achenia ovate, smooth or wrinkled, imperforate at base.—*Herbs, with rough-hairy or downy mostly sessile leaves, and spiked or racemed leafy-bracted white or yellow flowers.*

* *Flowers white.*

1. L. ARVENSE, L. *Corn Gromwell. Wheat-thief.*

Slender, hoary with minute appressed hairs; *leaves* lanceolate or linear-lanceolate; *calyx* nearly equal to the corolla, with spreading segments; *racemes* few-flowered, the lower flowers remote.

Grainfields, and waste grounds. June, July. Annual. *Stem* 12 to 18 inches high, more or less branched. *Leaves* 1 to 2 inches long, brigth green, rough. *Flowers* small, white, subsessile, solitary in the axils of the upper leaves.

2. L. OFFICINALE, L. *Common Gromwell.*

Stem herbaceous, erect, very branching above; *leaves* broadly lanceolate, acute, veiny; *calyx* about as long as the tube of the corolla; *achenia* very smooth.

Waste grounds, introduced, sparingly naturalized. June, July. *Stems* much branched, clustered, 12 to 18 inches high. *Leaves* grayish-green, rough on the upper side, hairy beneath 2 to 3 inches long, ½ to ¾ wide. *Flowers* small, white, axillary, in leafy spike-like racemes.

** *Flowers yellow. Perennials.*

3. L. HIRTUM, Lehm. *Hairy Puccoon.*

Herbaceous, hairy above, erect; *leaves* linear-lanceolate, rough-hairy, obtuse; the floral ovate-lanceolate; *corolla-tube* about as long as the calyx, bearded at the base inside, *lobes* obovate; *achenia* ovoid, shining.

Dry woods. May, July. *Stems* 8 to 12 inches high, clustered. *Flowers* crowded in somewhat scorpoid racemes. *Corolla* large, orange yellow.

6. MYOSOTIS, Linn. FORGET-ME-NOT.

Gr. *mus*, mouse, and *ous*, *otos*, ear, in allusion to the leaves of some species.

CALYX 5-cleft or 5-parted. COROLLA salver-form; *tube* short; *limb* flat; *throat* closed with 5 short arching appendages. STAMENS 5, included, on short filaments. ACHENIA smooth compressed.—*Low and mostly soft-hairy herbs, with entire leaves, and small blue or white flowers in naked racemes.*

1. M. STRICTA, Link. *Field Scorpion Grass.*

Whole plant somewhat hoary; *stem* erect, simple or branched; *leaves* oblong, obtuse; *raceme* leafy at the base, long; *pedicels* erect in fruit, rather shorter than the 5-cleft calyx, *corolla-tube* included. (M. arvensis, *Pursh*, M. verna, Nutt.)

Dry hills and sandy woods, rare. May—July. Ann. Whole plant of a grayish hue from its dense pubescence, 4 to 10 inches high, at length much branched. *Leaves* ⅓ to 1 inch long, sessile, acutish, the lower ones obtuse. *Flowers* very small, white or pale blue, on terminal revolute racemes, short at first but at length 6 to 8 inches long.

2. M. LAXA, Lehm. *Marsh Scorpion Grass. Forget-me-not.*

Ascending stems rooting along at the base, terete, branching, sprinkled with minute appressed hairs; *leaves* linear-oblong, obtuse; *pedicels* filiform, longer than the flowers, spreading; *calyx* 5-cleft; *style* very short.

Ditches and marshy places, common. June—Sept. Per. *Stem* 6 to 15 inches high, ascending from long creeping roots. *Leaves* scattered, sessile, 1 to 3 inches long, ¼ to ½ inch wide, the lower often petioled. *Flowers* small bright blue with a yellowish eye, on pedicels ¼ to ½ inch long.

3. M. PALUSTRIS, With. *True Forget-me-not.*

Whole plant more or less hairy; *stem* angled; *leaves* oblong-lanceolate, acutish;

style nearly as long as the 5 toothed calyx. May—Sept. Per. Native of Europe, probably wrongly attributed to this country also. *Stem* creeping, and with the *leaves* covered with close appressed hairs. *Corolla* bright blue, with a yellow eye, ⅕ to ¼ inch in diameter.

7. MERTENSIA, Roth. Lungwort.

In honor of *Prof. Mertens*, an early German botanist.

Calyx short, 5-cleft or 5-parted. Corolla trumpet-shaped, much longer than the calyx, naked or with 5 small folds in the throat; *border* spreading, 5-lobed. Stamens inserted in the upper part of the tube, protruding. Style long and filiform. Achenia ovoid, smooth or somewhat wrinkled.—*Smooth! perennial herbs, with pale entire ovate leaves, and showy purplish blue* (rarely white) *flowers in terminal racemes.*

M. Virginica, DC. *Virginian Cowslip. Lungwort.*

Stem upright; *radical leaves* ovate oblong, obtuse; *stem-leaves* narrower; *racemes* at first corymbed, elongated in fruit; *corolla* 4 times as long as the calyx, naked in the throat. (Pulmonaria Virginica.)

Alluvial banks, often cultivated. May. A showy plant 10 to 20 inches high, with smooth somewhat glaucous leaves, 4 to 8 inches long. *Flowers* large, bright blue, 1 inch long.

8. ECHINOSPERMUM, Swartz. Stickseed.

Gr. *echinos*, a hedgehog, and *sperma*, seed; from the prickly nutlets.

Calyx 5-parted. Corolla salver-form, short; *throat* closed by short scales, the *limb* with obtuse lobes. Stamens included. Achenia erect, fixed to a central column, triangular or compressed, the margin armed with prickles, barbed at the apex.—*Rough-hairy and grayish herbs, with oblong or linear leaves, and small blue flowers in bracted racemes.*

E. Lappula, Lehm. *Common Stickseed. Burrseed.*

Stem erect, branched above; *leaves* lanceolate, sessile, bristly-ciliate; *corolla* longer than the calyx, *border* erect, spreading; *achenia* with 2 rows of hooked prickles on the margin.

Roadsides, probably introduced. July, Aug. Ann. *Stem* erect, 10 to 20 inches high. *Leaves* 1 inch long, ⅛ to ¼ wide. *Flowers* minute, blue, in leafy racemes.

9. CYNOGLOSSUM, Tourn. Hound's-tongue.

Gr. *kuon*, a dog, and *glossa*, a tongue; in allusion to the form of the leaves.

Calyx 5-parted. Corolla short, funnel-form, the throat closed with 5 obtuse scales; lobes rounded. Stamens included. Achenia depressed or convex, laterally affixed to the base of the style, covered with short hooked prickles.—

Coarse herbs, with mostly panicled racemes of blue, purple or white flowers, naked above but usually bracted at the base.

1. C. OFFICINALE, L. *Common Hound's-tongue.*

Clothed with silky hairs, leafy, panicled above; *lower leaves* lanceolate, oblong, attenuated into a petiole; *upper* lanceolate, closely sessile by a rounded or slightly heart-shaped base; *racemes* without bracts; *calyx lobes* oblong, obtuse, shorter than the corolla.

Waste grounds, introduced. May, June. Bienniel. An erect downy plant of a dull green color, 18 to 20 inches high. *Lower leaves* 6 to 10 inches long and 1 to 2 inches wide. *Flowers* purplish-red in naked one-sided racemes. *Fruit* rough, adhering to the fleece of sheep.

2. C. VIRGINICUM, L. *Wild Comfrey.*

Roughish with spreading bristly hairs; *stem* simple, with few leaves; *lower leaves* oval-oblong, petiolate; *upper* lance-oblong, clasping by a deep heart-shaped base; *racemes* somewhat corymbose, naked; *calyx lobes* acute, villous, about half as long as the tube of the corolla.

Rich shady woods. May, June. Pĕr. *Stem* 2 to 3 feet high, very hairy. *Root leaves* 5 to 6 inches long and half as wide. *Flowers* pale blue or nearly white, in a terminal corymbose panicle.

3. C. MORISONI, DC. *Begger's Lice.*

Stem erect, hairy, broadly branched, leafy; *leaves* oblong-ovate, acute, tapering to the base, thin, minutely downy underneath and roughish above; *racemes* panicled, forking, diverging, hairy, with leafy bracts at the base; *pedicels* reflexed in fruit.

Borders of woods, rather common. July. Bienniel. *Stem* 2 to 3 feet high, furrowed, with many slender remote branches. *Leaves* entire, remote, 3 to 4 inches long, tapering to each end. *Flowers* very small, white or pale blue in forked terminal racemes. *Pedicels* reflexed in fruit. *Achenia* convex, the prickles with barbed points.

CULTIVATED EXOTICS.

10. BORAGO, Tourn. BORAGE.

CALYX 5-parted. COROLLA wheel-form, with acute segments; *throat* closed with rays. FILAMENTS converging. ACHENIA rounded, imperforate at base, inserted lengthwise into an excavated receptacle.—*European herbs, with alternate rough leaves, and mostly blue flowers in one-sided clusters revolute before expansion.*

B. OFFICINALIS, L. *Common Borage.*

Leaves ovate, alternate, the lower ones petioled; *calyx* spreading; *peduncle* terminal, many-flowered. Annual. The whole plant is rough with short bristly hairs, erect, 1 to 2 feet high. *Flowers* in terminal clusters, sky blue, flowering all summer.

11. ANCHUSA, Linn. BUGLOSS.

CALYX 5-parted. COROLLA funnel-form, vaulted; *tube* straight; *orifice* closed with 5 prominent scales. STAMENS included. STIGMA emarginate. ACHENIA perforate at the base, with mostly rugose surfaces.—*Showy, mostly European plants with cyanic flowers.*

A. OFFICIANALIS, L. *Bugloss Ox-tongue.*

Leaves lanceolate, clothed with short stiff appressed hairs; *spikes* one-sided, imbricated; *calyx* as long as the tube of the corolla. A rough garden plant, native of Britain. *Stem* 2 feet high, rough with bristly hairs. *Leaves* long, rough. *Bracts* ovate. *Flowers* purple, with a long hairy corolla, very attractive to bees.

12. PULMONARIA, Linn. LUNGWORT.

CALYX prismatic, 5-angled, 5-toothed. COROLLA funnelform, with a cylindrical tube; *orifice* hairy in 5 lines alternating with the stamens. ACHENIA imperforate.—*European perennial herbs, with mostly blue flowers.*

P. OFFICIANALIS, L. *Common Lungwort.*

Plant rough; *radical leaves* ovate, cordate, scabrous; *stem leaves* ovate, sessile; *calyx* as long as the corolla tube. Native of England, but naturalized and cultivated in our gardens. *Stem* 10 to 15 inches high, with rough leaves. *Flowers* blue, in terminal clusters.

ORDER 76. HYDROPHYLLACEÆ.—*Waterleaf Family.*

Herbs, commonly hairy, with mostly alternate and cut-lobed leaves, regular 5-parted and 5-androus blue or white flowers, and an ovoid entire 1-celled ovary, with 2 parietal few to many ovuled placentæ, which usually project into the cell and often lines it like an interior capsule. STYLE 2-cleft above. CAPSULE globular, 2-valved few-seeded.

1. HYDROPHYLLUM, Linn. WATER-LEAF.

Gr. *hudor*, water, and *phullon*, leaf, of no obvious application to the plant.

CALYX 5-parted, rarely with a small appendage in each sinus. COROLLA bell-shaped, 5-cleft, the tube furnished with 5 longitudinal appendages opposite the lobe which cohere by their middle, with their edges folded inwards, forming a necteriferous groove. STAMENS 5, exserted; *filaments* more or less bearded. OVARY bristly-hairy. CAPSULE globose, 2-celled, 2-valved, 4-seeded, 3 of the seeds mostly abortive.—*North American perennial herbs, with petioled pinnately or palmately veined leaves, and scorpoid bractless clustered cymes of white or pale blue flowers.*

* *Calyx not appendaged; filaments much exserted.*

1. H. MACROPHYLLUM, Nutt. *Great Waterleaf.*

Rough hairy; *leaves* oblong, pinnate and pinnatifid, the divisions ovate, obtuse, coarsely cut-toothed: *peduncle* very long; *calyx-lobes* lanceolate-acuminate with a broad base, very hairy.

Allegheny mountains. July. *Stem* about 1 foot high, almost leafless. *Root-leaves* 1 foot long, with 9 to 13 divisions. *Flowers* white in a terminal globose cyme, crowded. *Corolla* twice longer than the sepals. *Filaments* ¾ inch long.

2. H. Virginicum, L. *Virginian Waterleaf.*

Smoothish; *leaves* pinnately divided, the divisions ovate-lanceolate or oblong, pointed, sharply cut-toothed, the lowest mostly 2-parted, the uppermost confluent; *peduncles* as long as the petioles; *calyx-lobes* narrow-linear, bristly-ciliate.

Rich moist woods and fence-rows; common. June. *Stem* 12 to 16 inches high, often branched from the base. *Leaves* pinnately cut into 5 to 7 segments, on long petioles. *Flowers* white or blue, in crowded clusters, on forked peduncles.

3. H. Canadense, L. *Canadian Waterleaf.*

Nearly smooth; *leaves* palmately 5 to 7-lobed, rounded, heart-shaped at the base, unequally toothed; the radical leaves sometimes with 2 or 3 small and scattered lateral leaflets; *peduncles* mostly shorter than the long petioles, forked, the crowded flowers on very short petioles.

Shady woods. June. *Stem* 12 to 18 inches high, arising from a thickened rootstock. *Leaves* 3 to 5 inches broad; *lobes* broad, cut and toothed. *Fascicles* dense, axillary and terminal. *Corolla* white or variously tinged with purple, ½ to ¾ inch broad. *Filaments* hairy about half way up.

* * *Corolla appendaged between the sepals at base; stamens scarcely exceeding the corolla.*

4. H. appendiculatum, Michx. *Hairy Waterleaf.*

Hairy; *stem-leaves* palmately 5-lobed, rounded, the lobes toothed and pointed the *lowest* pinnately divided; *cymes* rather loosely flowered; *sepals* lance-subulate. (Nemophila paniculata, Spreng.)

Moist woods, not common. May. *Stem* 12 to 18 inches high, branched. *Leaves* on petioles 1 to 4 inches long, roundish in outline, the broad acute lobes diverging in a stellate manner. *Calyx* nearly ½ inch long, appendages deflexed, 1 inch long. *Corolla* blue, on long peduncles.

2. PHACELIA, Juss.

Gr. *phakelos*, a fascicle, probably in allusion to the clustered or forked racemes.

Calyx 5-parted. Corolla open bell-shaped, 5-cleft, the scale-like appendages in the tube sometimes obsolete. Ovary with 2 linear adherent placentæ, each 2-ovuled. Capsule ovoid, 2-valved, 4-seeded.—*Hairy herbs, with alternate divided leaves and usually pale blue flowers in forked scorpoid racemes or raceme-like cymes.*

1. P. bipinnatifida, Michx. *Pinnatifid Phacelia.*

Stem somewhat erect, branching, hairy; *leaves* pinnately divided, the divisions or leaflets ovate, acute, incisely lobed or pinnatifid; *racemes* elongated 2 to 4 parted, many-flowered; *corolla-lobes* entire, twice as long as the linear-acuminate calyx.

Shaded banks and damp woods, rare. May, June. Ann. *Stem* 10 to 20 inches high, often much branched from near the base. *Leaves* 3 to 6 inches long, including the petiole, thin and smoothish, bright blue ⅓ to ½ inch in diameter, the grooves bordered with narrow pubescent margins. *Raceme* erect in fruit.

2. P. Purshii, Buckley. *Fimbriate Phacelia.*

Whole plant hairy; *stem* upright or ascending; *lower leaves* pinnately divided, petiolate, the segments few and entire; *upper* deeply pinnatifid, sessile and partly clasping, the *lobes* lanceolate, acute or pointed, entire; *raceme* 8 to 10-flowered, simple; *pedicels* elongated; *calyx-lobes* lance-linear, acutish; *corolla* fimbriate. (P. fimbriata, Pursh. Cosmanthus fimbriatus, Nolte.)

Moist woods and river bottoms. April—June. Biennial. *Plant* 8 to 12 inches high, slender and with slender branches. *Corolla* light blue, ¼ to ½ inch in diameter, strongly laciniate-fringed, nearly destitute of folds and scales inside.

3. COSMANTHUS, Nolte.

Gr. *kosmos*, elegance, *anthos*, a flower.

Calyx 5-parted, the sinuses naked. Corolla broadly bell-shaped, 5-cleft, without scales. Stamens 5, slender, about as long as the corolla. Style bifid; ovary 1-celled, hairy above. Capsule 2-valved, septiferous in the middle, 2 to 4, sometimes 8-seeded.—*North American annual herbs, with alternate leaves, and white or pale blue flowers, in long bractless racemes.*

C. PARVIFLORUS, DC. *Small-flowered Cosmanthus.*

Diffuse, pubescent; *leaves* pinnatifid and trifid, middle lobe obovate, lateral acute, diverging; *lower leaves* petiolate, upper sessile; *raceme* solitary; *calyx-lobes* lance-ovate, shorter than the corolla; *stamens* exserted; *filaments* hairy at base.

River banks and hillsides, common along the Susquehanna. May. *Stem* often branched from the base, 4 to 8 inches high. *Corolla* smooth, pale blue inclining to violet, greenish white in the centre, the divisions rounded.

4. EUTOCA.

Gr. *eutokos*, fruitful

Calyx 5-parted. Corolla 5-cleft, broadly bell-shaped, caducous, the tube without appendages. Stamens 5, as long as the corolla. Style bifid; *ovary* hairy. Capsule 1-celled, 2-valved, the valves septiferous in the middle. Seeds numerous, rugulose.—*Annuals, with alternate leaves and showy blue or white flowers.*

E. VESCIDA. *Viscid Eutoca.*

Stem ascending, branched, covered with a viscid glandular pubescence; *leaves* ovate-cordate, crenate-serrate; *corolla* broadly bell-shaped or salver-form. A beautiful garden annual, often cultivated. *Stem* 1 to 2 feet high, very visced, emitting a very disagreeable odor. *Calyx-segments* narrow, ⅔ as long as the corolla-lobes *Corolla* deep-blue with a white centre sprinkled with purple in the form of a pentagon, ¾ to 1 inch in diameter- *Filaments* hairy.

5. NEMOPHILA. Grove-love.

Gr. *nemos*, a grove, and *phileo*, to love; so called from its habitat.

Calyx 10-parted, the *alternate lobes* reflexed. Corolla flat bell-shaped, 5-lobed; the *lobes* emarginate, with necteriferous cavities at the base. Stamens shorter than the corolla. Capsule fleshy, 2-valved, 4-seeded.

1. N. INSIGNIS. *Blue Grove-love.*

Leaves alternate, pinnatifid, with some of the divisions lobed; *calyx* ½ the length of the corolla, with acute segments; *lobes of the corolla* rounded, slightly emarginate; *anthers* sagittate; *style* bifid. A beautiful garden annual 6 to 8 inches high. *Stem* branched. *Leaves* 2 to 3 inches long, ½ inch wide, the petiole beset with hairs along each side. *Peduncles* very long terete, 1-flowered. *Corolla* sky blue, white in the centre. *Anthers* dark purple. June—Aug.

N. ATOMARIA, has white flowers, spotted with brown or black, sometimes found in cultivation.

ORDER 77. POLEMONIACEÆ.—*Polemonium Family.*

Herbs, with alternate or opposite leaves, regular 5-merous and 5-androus flowers, the lobes of the corolla convolute in the bud, a 3-celled ovary and 3-lobed style, the capsule 3-celled, 3-valved, loculicidal, few-many-seeded. CALYX 5-cleft, persistent. COROLLA with a 5-cleft border. STAMENS often unequal or unequally inserted on the tube of the corolla.

1. PHLOX, Linn. LYCHNIDIA.

Gr. *phlox*, flame, an ancient name of Lychnis, transfered to this genus.

CALYX somewhat prismatic, the segments erect. COROLLA salver-form, the tube slender, somewhat curved, the limb flat, 5-lobed. STAMENS very unequally inserted in the tube of the corolla. CAPSULE ovoid, with a single seed in each cell.—*Chiefly perennial North American plants, with opposite sessile mostly entire leaves, and purple pink or white flowers, in open clusters terminal or crowded in the upper axils, cymose, mostly bracted.*

* *Lobes of the corolla entire. Perennials.*

1. P. PANICULATA, L. *Panicled Phlox.*

Tall and stout, smooth; *leaves* oblong lanceolate, lanceolate and ovate-lanceolate, acuminate, large, tapering at the base, the upper often heart-shaped at the base; *panicle* pyramidal-corymbed, many-flowered; *calyx-teeth* awn pointed; *corolla lobes* obovate.

Rich woods and meadows, cultivated in gardens. June, July. *Stem* 2 to 3 feet high. *Leaves* 3 to 5 inches long, ¾ to 1¼ wide, the lower ones distinctly petioled. *Flowers* very numerous, pink-purple varying to white, in a large oblong terminal panicle. Var. *acuminata.* (P. acuminata, Pursh.) has the broad and acuminate leaves downy underneath, like the stem, which is likewise occasionally spotted below.

2. P. MACULATA, L. *Spotted Phlox.*

Smooth or slightly roughish; *stem* erect, simple, spotted with purple; *lower leaves* lanceolate, the *upper* nearly ovate-lanceolate, rounded or somewhat heart-shaped at the base; *panicle* oblong, thyrsoid or somewhat pyramidal; *calyx-teeth* triangular-lanceolate, short, scarcely pointed.

Rich woods, moist meadows and river banks, common, often cultivated. June—July. *Stem* 2 to 3 feet high, mostly simple, sometimes spotted with dark purple. *Flowers* mostly purple or crimson, sometimes white, when it is P. suaveolens, Ait

When the lower branches of the panicle are elongated so as to form a pyramidal panicle, it is P. pyramidalis, Smith.

3. P. CAROLINA, L. *Carolina Phlox.*

Smooth; *stem* rather slender, branched at the base, ascending; *leaves* oblong-lanceolate or the upper ovate-lanceolate, acute, the lower with a slender tapering base, the upper sessile by a rounded base, margins revolute; *calyx-teeth* short-acuminate; *corolla-tube* awned, segments entire.

Open woods and barren places, not common. June, July. *Stem* 1 to 2 feet high from a decumbent or creeping base. *Leaves* 2 to 4 inches long, mostly quite narrow, ¼ to ½ inch wide, thick and shining. *Flowers* large, pink-purple, 15 to 25 in a corymbose panicle.

4. P. PILOSA, L. *Hairy Phlox.*

Downy-hairy throughout; *stems* slender, rather upright; *leaves* lance-linear, or narrowly acute, the uppermost broadest at the base; *flowers* loosely corymbed; *calyx-teeth* hairy, very long, awn-like; *corolla-lobes* obovate, entire.

Barrens and wet places, May, June. *Stem* 10 to 20 inches high, weak. *Leaves* 1½ to 3 inches long, ¼ to ½ inch wide, with the margins revolute. *Flowers* rose-purple or pale, the corolla-tube a third longer than the long, slender teeth of the calyx.

5. P. REPTENS, Michx. *Creeping Phlox.*

Pubescent; *stem* erect with procumbent suckers at base; *lower leaves* roundish-obovate, thick, those of the stem small, oval or oblong, obtuse; *cyme* simple, 3 to 8-flowered; *calyx-teeth* linear-awl-shaped.

Damp woods and rocky places, rare. April, May. Runners creeping and bearing roundish-obovate leaves, tapering into short margined petioles. *Stem* low, 4 to 10 inches high, ascending, clammy-pubescent, with leaves ½ to ¾ inch long, ¼ to ½ wide, remote. *Flowers* large, reddish-purple or crimson.

* * *Lobes of the corolla notched at the end. Perennial.*

6. P. DIVARICATA, L. *Early-flowering Phlox.*

Minutely downy, loosely branched from the base, the flowering stems ascending; *leaves* oval-lanceolate or oblong, obtuse; *cyme* corymbose-panicled, loosely flowered; *calyx-teeth* linear-awl-shaped; *corolla-lobes* inversely heart-shaped.

Rocky damp woods and fence-rows, common. May. *Flowering-stems* 9 to 15 inches high. *Upper leaves* nearly clasping and often alternate. *Flowers* large, of a peculiar brilliant grayish-blue color.

7. P. SUBULATA, L. *Moss Pink. Mountain Pink.*

Minutely downy; tufted, procumbent, much branched; *leaves* awl-shaped or narrow-linear, somewhat rigid, crowded and with numerous smaller ones clustered in the axils; *corymb* few-flowered; *calyx-teeth* awl-shaped; *corolla-lobes* wedge-shaped, emarginate.

Dry hills and sandy banks, common. April, May. A showy plant, forming low matted and prostrate tufts, often cultivated in gardens. *Stem* 6 to 12 inches long, with numerous assurgent branches, 2 to 3 inches high. *Leaves* ½ inch long. *Flowers* pink-purple or rose-color rarely white with a purple centre, 3 to 5 in one corymb.

* * * *Lobes of the corolla entire. Annual.*

8. P. DRUMMONDII, Hook. *Drummonds' Phlox.*

Erect, dichotomously branched, glandular-pilose; *leaves* oblong or lancelate, scabrous; *corymb* dense-flowered; *calyx* hairy, segments lanceolate, setaceous, elongated, revolute; *corolla-tube* pilose, segments obovate entire. July, Aug. A beautiful annual species, native of Texas, common in cultivation. *Stem* 8 to 12 inches high, and with the leaves rough-glandular. *Flowers* very showy, all shades from white to dark-purple, with a deeper colored centre.

2. POLEMONIUM, Tourn. Greek Valerian.

Name employed by Dioscorides, from *polemos*, war; of doubtful application.

Calyx bell-shaped, 5-cleft. Corolla bell-shaped-rotate; *tube* very short, closed by the hairy appendages at the bases of the 5 filaments. Capsule few, several-seeded.—*Low branching herbs, with alternate pinnate leaves, and blue or white flowers, in nearly bractless corymbs.*

1. P. reptans, L. *Greek Valerian. Jacob's Ladder.*

Smooth, diffusely branched; *leaves* 7 to 11-foliate; *leaflets* ovate-lanceolate or oblong, acute, entire; *corymbs* few-flowered; *flowers* nodding.

Moist woods and shady river banks. May. Per. A handsome plant often cultivated, 12 to 18 inches high, with a weak and fleshy stem. *Leaflets* mostly 7, subopposite, smooth, as well as the common petiole. *Flowers* blue, in small nodding corymbs at the end of the branches.

2. P. cœruleum, L. *Greek Valerian.*

Stem smooth, simple, erect; *leaves* pinnately 11 to 17-foliate; *segments* acuminate; *flowers* erect; *calyx* as long as the tube of the corolla; *cells of capsule* 6 to 10-seeded. Native of England. Bienniel. *Stems* clustered, several from the same root, about 2 feet high, hollow, stout, each dividing at top into a corymbose panicle. *Leaves* mostly radical, on long grooved petioles. *Flowers* blue, about ½ inch in diameter, terminal, suberect.

CULTIVATED ORNAMENTAL PLANTS.

3. GILIA, Ruiz & Pavon.

Calyx 5-cleft, membranaceous, smooth or downy. Corolla somewhat funnel shaped, 5-parted. Stamens 5, inserted on the inner side of the tube of the corolla. Disk cup-form. Capsule oblong or ovoid, 3-celled few-seeded.—*Showy annual or bienniel plants, with alternate pinnatifid leaves, and blue or particolored flowers in close capitate clusters or scattered panicles.*

1. G. tricolor, Benth. *Tri-colored Gilia.*

Stem erect, nearly smooth; *leaves* twice or thrice pinnatifid, with narrow linear segments; *cymes* paniculate, 3 to 6 flowered; *calyx* shorter than the tube of the corolla. downy; *corolla* tricolored, with a very short tube. An elegant garden plant native of California. July, Aug. *Stem* 6 to 12 inches high, with bright green shining leaves. *Flowers* numerous, the limb of the corolla pale lilac-blue, throat purple and tube yellow. *Stamens* ½ as long as the corolla.

2. G. Achilleæfolia, Benth. *Millfoil-leaved Gilia.*

Stem erect, hairy; *leaves* pinnatifid, somewhat hairy toward the base, nearly smooth at the extremety; *flowers* corymbed, more dense then in G. tricolor; *calyx* shorter than the tube of the corolla. Native of California. July, Aug. *Stem* 10 to 15 inches high. *Flowers* bright purple, ½ inch in diameter.

4. IPOMOPSIS.

CALYX 5-parted, tubular and membranaceous. COROLLA funnel-shaped, the tube much exserted, deciduous. STAMENS 5, inserted in the tube of the corolla. CAPSULE 3-celled, many-seeded; *seeds* angular.—*Showy biennials, with alternate finely pinnatifid leaves, and showy scarlet, orange or reddish flowers in clustered panicles.*

I. PICTA. *Painted Ipomopsis.*

Stem erect, tall, hairy; *leaves* crowded, pinnatifid with subulate divisions; *thyrse* elongated, with very short branches; *corolla* elongated, with a slender tube, and spreading segments; *stamens* much exserted. Native of Carolina. Aug. A splendid plant, 2 to 4 feet high, bearing at the top a thyrse of flowers 1 foot long. *Corolla* 1¼ inch long, orange-red, spotted with carmine, the mouth of the tube nearly white.

ORDER 78. **CONVOLVULACEÆ.**—*Bindweed Family.*

Twining or trailing herbs, with alternate entire or lobed leaves, and regular 5-androus flowers, with a calyx of 5 *imbricated persistent sepals, a* 5 *plaited or* 5*-lobed corolla, twisted in the bud, and a 2-celled* (rarely 3-celled) *ovary, with a pair of erect ovules from the base of each cell, the cells often doubled by a false partition.* FLOWERS usually large and showy, opening but for one day. STAMENS 5, inserted into the base of the corolla. FRUIT a globular 2 to 6-seeded capsule.

SUB-ORDER I. CONVOLVULACEÆ. THE TRUE BINDWEED FAMILY.

EMBRYO with cotyledons; CARPELS united. FRUIT capsular, dehiscent.—*Green and leafy plants.*

1. CALYSTEGIA, R. Brown. BRACTED BINDWEED.

Gr. *kalyx*, calyx, and *stego*, to cover; alluding to the bracts inclosing the calyx.

CALYX 5-parted, enclosed in 2 large foliaceous bracts; *sepals* equal. COROLLA between bell-shaped and funnelform, 5-folded, the border obscurely 5-lobed or entire. STAMENS 5, included. STYLE 1; *stigmas* 2; *ovary* imperfectly 2-celled. CAPSULE 1-celled, 4-seeded.—*Perennials, with heart-shaped or arrow shaped leaves, and axillary* 1*-flowered peduncles.*

1. C. SEPIUM, R. Br. *Hedge Bindweed.*

Smooth; *stem* twining; *leaves* arrow-shaped or somewhat halbert-form, pointed, the lobes at base obliquely truncate and often toothed; *peduncles* 4-angled, 1-flowered; *bracts* heart-shaped, much longer than the calyx. (Convolvulus sepium, L.)

A vigorous climber, in hedges and low grounds. June. July; cultivated. *Flowers* about 2 inches in diameter, white, often tinged with rose-color, opening at dawn and cloudy weather.

2. C. SPITHAMÆA, Pursh. *Erect Bindweed.*

Downy; *stem* low, and mostly simple, erect or ascending; *leaves* oblong-lanceolate, subcordate or auricled at base, obtuse or pointed at the apex; *peduncles* usually longer than the leaves, 1-flowered. (Convolvulus stans, Michx.)

Dry fields and hilly pastures. June, July. *Stem* 6 to 12 inches high, not twining, branching, leafy. *Leaves* 2 to 3 inches long, ½ as wide, with an abrupt, cordate base, on petioles, ½ to ¾ inch long. *Flowers* 2 inches long, white on peduncles 2 to 4 inches long. *Bracts* concealing the calyx.

2. CONVOLVULUS, Linn. MORNING-GLORY.

Lat. *convolvo*, to entwine.

CALYX 5-parted, naked. COROLLA bell-shaped or funnel-form, with a spreading nearly entire or 5-lobed border. STAMENS 5, mostly included. STYLE 1, often 2-cleft at the apex; STIGMAS 2, rarely 3. CAPSULE 2 to 3-celled, 2 to 3-valved.—*Chiefly twining or trailing plants, often with milky juice, and axillary peduncles, 1-many flowered.*

SEC I. CONVOLVULUS proper.—*Stigmas* 2, linear; *capsule* 2 celled.

1. C. ARVENSIS, L. *Small Bindweed.*

Stem procumbent or twining, low, angled, somewhat hairy; *leaves* ovate-oblong, arrow shaped, with acute lobes at the base; *peduncles* mostly 1-flowered, bibracteate, near the base; *sepals* roundish-ovate.

Fields, common, introduced from Europe; a very troublesome weed. June, July. *Stems* several feet long. *Leaves* 1 to 2 inches long, the lower ones obtuse, on short petioles. *Flowers* 1 inch long, white, often with a tinge of red, on peduncles longer than the base.

SEC II. IPOMŒA, L. *Stigmas* 2, globular or united into one; *capsule* 2-celled, 4-seeded.

2. C. PANDURATUS, L. *Wild Potato-vine.*

Stem trailing or sometimes twining; *leaves* broad-cordate or panduriform; *peduncles* 1 to 5-flowered, longer than the petioles; *calyx* smooth, with ovate-oblong sepals; *corolla* open-funnel-form.

Sandy fields and dry banks common. July, Aug. *Stems* long and stout, from a thick root which often weighs 10 to 20 pounds. *Leaves* 2 to 3 inches long, and about the same width, acute or obtuse, occasionally some of them are contracted at the side so as to be fiddle-shaped. *Flowers* 3 inches long, purplish and white, opening in the forenoon. *Man-of-the-earth.*

3. C. LACUNOSUS, Spreng. *Morning-Glory.*

Rather smooth; *stem* creeping and twining, slender; *leaves* heart shaped, pointed, angular-lobed or entire, en long petioles; *peduncles* very short, 1 to 3-flowered; *sepals* oblong-lanceolate, acute, half as long as the corolla; *corolla* 5-lobed.

Woods, dry fields and hills, rare. Aug., Sept. A small prostrate species, 2 to 6 feet long. *Leaves* 3 inches long, 1½ wide, deeply heart-shaped, often deeply 3-lobed; *petioles* 1 to 3 inches long. *Flowers* ½ to ⅔ inch in diameter, ¾ inch long, white with a purplish rim, the corolla 5-lobed.

SEC. III. PHARBITIS, Choisy.—*Stigmas* mostly 3, united, capitate; *capsule* 3-celled; *cells* 2-seeded.

4. C. Nil, L. *Blue Morning-Glory.*

Stem hairy, twining; *leaves* cordate, 3-lobed, the intermediate lobe dilated at the base, the lateral ones shorter acute; *peduncles* short, 1 to 2 flowered.

A beautiful plant indigenous in the southern parts of the State, but known as a garden plant. July—Sept. *Calyx* hairy, the segments long-acuminate. *Flowers* large, the tube white and the border of a clear blue color.

5. C. purpureus, L. *Common Morning-Glory.*

Twining, hairy; *leaves* roundish-heart-shaped, entire, pointed; *peduncles* elongated, 3 to 6-flowered; *sepals* ovate-lanceolate, acute; *corolla* funnel form, with a spreading entire border.

Fields and about gardens, common in cultivation. June—Sept. *Stem* climbing 6 to 25 feet. *Flowers* large, beautiful, dark-purple, violet, blue, pink, and sometimes nearly white.

Sec. iv. Batatus. *Stigma* capitate, 2-lobed; *ovary* 4 or by abortion 3 to 2-celled.

6. C. Batatus, L. *Sweet Potato.*

Stem creeping, rarely twining; *leaves* heart-shaped, hastate, angular, 5-veined, smoothish; *peduncles* long; *flowers* fascicled; *sepals* lanceolate, acuminate. The sweet potato is found growing wild in both Indies, and is cultivated in all warm countries. The *stem* is round, hispid, prostrate, sending out scattered oblong tubers which are yellowish or purplish without. *Flowers* large purple and white.

3. QUAMOCLIT. Tourn. Cypress-vine.

Gr. *kuamos*, a bean, *klitos*, dwarf; resembles the climbing bean, but smaller.

Sepals 5, mostly mucronate. Corolla tubular-cylindrical. Stamens exserted. Style 1; *stigma* capitate, 2-lobed; *ovary* 4-celled, *cells* 1-seeded.—*Twining herbs, often with pinnatifid divided leaves, and delicate white yellow orange and scarlet flowers.*

1. Q. vulgaris, Choisy. *Jasmine Bindweed.*

Leaves pinnatifid to the midvein, segments linear, parallel, acute; *peduncles* 1 to 2-flowered; *sepals* ovate lanceolate.

An exceeding delicate vine, common in cultivation. July, Aug. Ann. *Stem* smooth, very slender, twining and climbing to the height of 5 to 10 feet. *Flowers* ½ to ¾ inch in diameter, scarlet varying to crimson and rose-color, sometimes white. *Corolla-tube* slender, *limb* flat, 5-parted.

2. Q. coccinea, Mœnch. *Scarlet-flowered Morning-Glory.*

Leaves heart-shaped, acuminate, entire or angular at base; *peduncles* elongated, about 5-flowered; *calyx* awned. Native of the Southern States, cultivated. July, Aug. Annual. *Flowers* scarlet or yellowish-tinged.

Sub-order ii. CUSCUTINEÆ. The Dodder Family,

Embryo slender, spirally coiled, entirely destitute of cotyledons.—*Parasitic yellowish or reddish plants, with thread-like naked stems and minute scales in place of leaves.*

4. CUSCUTA, Tourn. Dodder.

Calyx 5 (rarely 4)-cleft. Corolla globose-bell-shaped;

4 to 5-cleft. STAMENS 4 to 5, attached to the tube of the corolla, furnished with a scale-like often fringed appendage at their base. STYLES 2, distinct (or rarely united). OVARY 2-celled, 4-ovuled. CAPSULE mostly 4-seeded. EMBRYO thread-shaped, spirally coiled in the rather fleshy albumen, entirely destitute of cotyledons!—*Leafless, chiefly annual yellowish or reddish herbs, with thread-like stems, bearing a few minute scales in place of leaves; germinating in the soil at length withering at the root and becoming entirely parasitic on the bark of the herbs and shrubs; flowers small cymose-clustered, mostly white.*

1. C. EPILINUM, Wiehe. *Flax Dodder.*

Stems very slender; *flowers* in small and dense scattered heads; *corolla* globular-cylindrical, scarcely exceeding the 5-parted calyx, *leaves* small; *style* at first upright, not longer than the ovary.

Flax-fields, common; introduced from Europe. June. *Stem* reddish-orange. *Flowers* yellowish-white. *Calyx* thickish. *Stamens* included. *Stigma* acute. *Capsule* depressed-globose, surrounded with the withering corolla.

2. C. GRONOVII, Willd. *Common Dodder.*

Stem thickish, branched; *scales* oblong, fimbriate; *flowers* peduncled, in close or open cymes; *corolla* bell-shaped, 5-cleft, with short spreading or reflexed segments, withering at the base of the capsule; *calyx-lobes* broad-ovate, obtuse; *style* diverging; *stigma* capitate.

Low grounds, very common, chiefly on herbs. Aug., Sept. *Stem* smooth, slender, 3 to 5 feet long, and with the scales of a light orange-color, wholly destitute of green, always twining from right to left, or hanging in festoons. *Calyx* and *corolla* more or less dotted with pellucid glands, yellowish-white.

3. C. COMPACTA, Juss. *Compact-flowered Dodder.*

Bracts and *sepals* orbicular, concave, appressed, slightly crenate, much shorter than the slender cylindrical tube of the corolla. *Flowers* sessile, in dense clusters; *stamens* shorter than the linear-oblong spreading lobes of the corolla; *scales* pinnatifid-fringed.

Dry grounds, on shrubs. Southern parts of the State.

ORDER 79. SOLANACEÆ.—*Nightshade Family.*

Herbaceous or rarely shrubby plants, with a colorless juice, alternate leaves, regular 5-merous and 5-androus flowers, and the fruit a 2-celled (rarely 3 to 5-celled) *many-seeded capsule or berry.* CALYX usually persistent. COROLLA plaited or infolded; valvate in the bud. STAMENS mostly equally inserted on the corolla. STYLE and STIGMA single. PLACENTÆ in the axis, often projecting far into the cells. SEEDS nearly amphitropous.

1. NICOTIANA, Linn. TOBACCO.

In honor? of *John Nicot* of Languedoc, who is supposed to have introduced it into Europe.

CALYX tubular-bell-shaped, 5-cleft. COROLLA funnel-form or salver-form, usually with a long tube; *border* plaited, 5-lobed. STAMENS 5. STIGMA capitate. CAPSULE 2-celled, 2 to 4-valved from the apex. SEEDS minute.—*Rank acrid-narcotic herbs, mostly clammy pubescent, with large simple entire leaves and lurid flowers in racemes or panicles, white tinged with green or purple.*

1. N. RUSTICA, L. *Wild Tobacco.*

Viscid-pubescent; *leaves* petioled, ovate; *corolla tube* cylindrical, ⅔ longer than the calyx, the lobes rounded.

Sparingly naturalized near dwellings and old fields. Said to have been introduced by the Indians. Aug. *Stem* 12 to 18 inches high. *Flowers* greenish-yellow, in a terminal panicle or raceme.

2. N. TABACUM, L. *Virginian Tobacco.*

Viscid pubescent; *leaves* lanceolate, sessile, decurrent: *corolla-tube* inflated at the throat, lobes acute. Native of Central America. Extensively cultivated in the Middle and Western States, and is exported in vast quantities. *Stem* 4 to 6 feet high, paniculate above. *Leaves* 1 to 2 feet long, 6 to 12 inches wide, entire. *Flowers* rose color. July. Taken into the stomach, this plant is a powerful narcotic poison.

2. DATURA, L. JAMESTOWN-WEED.

Altered from the Arabic name, *Tatorah*.

CALYX prismatic, 5-toothed, separating transversely above the base in fruit. COROLLA funnel-form, with a large and spreading 5-toothed petioled border. STAMENS 5. STIGMA 2-lipped. CAPSULE globular, prickly, 4-valved, 2-celled; *cells* 2 to 3-parted, many-seeded.—*Narcotic-poisonous rank weeds with ovate angular-toothed leaves, and large and showy flowers on short peduncles in the forks of the branching stems.*

D. STRAMONIUM, L. *Thorn-Apple. Jamestown-Weed.*

Leaves ovate, smooth, angular-dentate; *calyx-teeth* pointed; *capsule* prickly, erect.

Waste grounds and roadsides, common; introduced. July—Sept. Annual. *Plant* 2 to 3 feet, often flowering when only 1 foot high. *Stem* smooth, hollow. *Leaves* large, situated at the base of the 2 forked branches. *Flowers* 2 to 3 inches long, solitary; *corolla* funnel-form, with a long tube and a plaited 5-toothed border, white with a slight tinge of purple. The whole plant is poisonous.

3. HYOSCYAMUS, Tourn. HENBANE.

Gr. *hus, huos*, a hog, *kuamos*, a bean; the fruit is said to be not poisonous to swine.

CALYX tubular, 5-toothed. COROLLA funnel-form, irregular, border 5-lobed, plaited. STAMENS 5, declined. STIGMA capitate. CAPSULE ovoid, 2-celled, covered by the persistent calyx, opening transversely all round the apex which falls off like a lid.—*Clammy-pubescent rank herbs, with angled or toothed leaves and lurid flowers in their axils.*

H. NIGER, L. *Black Henbane.*

Stem branching, erect, very leafy; *leaves* clasping, sinnate-toothed and angled; *flowers* sessile, in one-sided at length recurved leafy spikes.

A tall fœtid weed, sparingly naturalized, growing about waste places. July. Annual. *Stem* 1 to 2 feet high, round. *Flowers* large dull-yellow, with dark purple veins. A powerful narcotic Introduced from Europe.

4. NICANDRA, Adans. APPLE OF PERU.

Named after the poet *Nicander*, of Colophon.

CALYX 5-parted, 5-angled, the divisions arrow-shaped, enlarged and inflated in fruit, inclosing the 3 to 5-celled globular dry berry. COROLLA open-bell-shaped, with the plaited border nearly entire. STAMENS 5, converging.—*An annual smooth herb, with ovate sinuate-toothed or angled leaves and solitary pale blue flowers on axillary and terminal peduncles.*

N. PHYSALOIDES, Gært. *Apple of Peru.*

Stem herbaceous; *leaves* smooth, sinuate, angular; *flowers* solitary, axillary on short peduncles; *calyx* closed with the angles very acute.

Cultivated grounds, sparingly naturalized. Native of Peru. Aug. *Stem* 2 to 5 feet high, very branching. *Leaves* large, oblong decurrent. *Corolla* slightly lobed, pale blue, white and with 5 blue spots in the centre.

5. PHYSALIS, Linn. GROUND CHERRY.

Gr. *phusa*, a bladder, alluding to the inflated calyx.

CALYX 5-cleft, persistent, at length much inflated. COROLLA spreading-bell-shaped, with a very short tube, marked with 5 concave spots at the base; *border* plaited, somewhat 5-lobed. STAMENS 5, converging. FRUIT a 2-celled globular berry, enclosed within the inflated calyx.—*Herbs, rarely shrubs, with the leaves often unequally in pairs, and axillary or extra-axillary flowers on one-flowered peduncles.*

1. P. VISCOSA, L. *Ground Cherry. Yellow Henbane.*

Clammy-pubescent, low, very diffusely branched; *leaves* ovate or ovate-lanceolate, heart shaped or acute at base, somewhat angled toothed or entire; *flowers* nodding.

Dry fields and hill-sides, common. July, Aug. Per. A very variable plant and embracing many nominal species. *Stem* about 1 foot high, more or less decumbent. *Leeves* 1 to 4 inches long, ½ to ⅔ or even as wide, acute, acuminate, or often obtuse at the apex. *Corolla* pale greenish-yellow with 5 brownish spots at base. *Berry* yellowish, pleasant tasted, wholly inclosed in the much inflated calyx.

2. P. PHILADELPHICA, Lam. *Philadelphia Ground Cherry.*

Smoothish, erect; *leaves* obliquely ovate, pointed, angled; *calyx* open in fruit, scarcely inclosing the berry.

Dry river banks. July. Ann. "*Flowers* larger than in the preceding species, yellow, with brown stripes."

6. SOLANUM, Linn. NIGHTSHADE.

CALYX 5 to 10-parted, persistent, spreading. COROLLA mostly wheel-shaped; *tube* very short; *limb* plaited in the bud 5 to 10-lobed. STAMENS 5, exserted, converging around the style; *filaments* very short. BERRY usually 2-celled.—*Herbs or shrubs unarmed or prickly with pinnatifid or undivided, sometimes geminate leaves, and lateral, solitary or extra solitary peduncles.*

1. S. DULCAMARA, L. *Bittersweet Nightshade.*

Stem somewhat shrubby, climbing, mostly smooth; *leaves* ovate-heart-shaped, the upper ones halbert shaped, or with 2 ear-like lobes at the base; *flowers* in small cymes, which become lateral.

Moist banks and around dwellings, naturalized. June—July. Per. *Stem* branching several feet long. *Flowers* drooping on branching peduncles from the side of the stem. *Corolla* of reflexed segments, purple, with a green spot on each segment. *Berries* bright red.

2. S. NIGRUM, L. *Black Nightshade.*

Low, much branched and often spreading, ovate, wavy-toothed; *flowers* small in lateral umbel-like clusters, drooping; *berries* globular.

Waste places, common. introduced. July—Aug. Bienniel. A poisonous plant of no beauty, about a foot high. *Leaves* mostly erose on the margin as if gnawed by insects. *Flowers* very small, and with white-yellow anthers. *Berries* black.

3. S. CAROLINENSE, L. *Horse-Nettle.*

Herbaceous, prickly; *leaves* ovate-oblong, acute, sinuate-toothed or angled, hoary-pubescent, prickly along the midrib; *flowers* large in simple loose racemes; *berry* globular.

Roadsides, sandy soil, rare. June, July. Per. *Stem* erect, prickly, branched about one foot high, *Leaves* 4 to 6 inches long, 2 to 3 wide, usually in unequal pairs. with a few large repand lobes or teeth. *Flowers* pale blue or white, 1 to 1¼ inch in diameter, in lateral racemes. *Berry* globular, orange-yellow.

CULTIVATED SPECIES.

4. S. TUBEROSUM, L. *Common Potato.*

Root tuberous; *stem* herbaceous, winged; *leaves* interruptedly pinnate, pubescent; *flowers* subcorymbed; *corolla* 5-angled. This valuable plant is supposed to be a native of South America, where it still grows wild. Although it now constitutes a large portion of the food of man, it was scarcely known until the 17th century, and was not extensively cultivated before the middle of the 18th. Numerous varieties are raised from the seed, which differ in the time of ripening, quality, form, color, size, &c.

5. S. MELONGENA, L. *Egg Plant.*

Prickly; *leaves* ovate, subsinuate, downy; *flowers* many-parted. Ann. *Stem* branching, about 2 feet high. The fruit consists of large egg-shaped berries, from the size of an egg to that of a water melon, smooth, white or of a glossy purple. It is prepared in various ways, and considered delicious.

SEC. II. LYCOPERSICUM, Mill. *Berries* 3 to 6-celled, often torose.

6. S. LYCOPERSICUM, L. *Tomato.*

Hairy; *stem* herbaceous, weak; *leaves* unequally pinnatifid, segments cut, glaueous beneath; *fruit* torulose, furrowed, smooth. A common garden plant, resembling the potato in its general aspect, 2 to 4 feet high. *Flowers* greenish yellow. *Fruit* large, mostly with or without acute furrows, at first green, becoming when ripe of a beautiful red or golden yellow. The fruit is prepared in various ways, for sauces, stews, &c.

CULTIVATED EXOTICS.

7. ATROPA, Linn. Deadly Nightshade.

Name of one of the three fates of Grecian mythology, whose office was to cut the thread of human life.

Calyx persistent, 5-cleft. Corolla bell-shaped. Stamens 5, distant. Berry globose, 2-celled, situated on the calyx.—*Herbs, shrubs or trees, natives of the Old World.*

A. Belladonna, L. *Deadly Nightshade.*

Stem herbaceous; *leaves* ovate, entire acuminate at both ends, in pairs, on short petioles: *flowers* solitary, somewhat drooping, on short, 1-flowered axillary peduncles; *calyx* deeply divided into 5 ovate segments; *stamens* shorter than the corolla, bearing heart-shaped 4-lobed anthers. Native of Europe. A powerful narcotic poison, often cultivated. *Stem* 5 feet high, branching below, and with the large leaves purplish. *Flowers* pale purple externally, darker on the upper internal surface, and yellowish below. *Berries* about the size of a small cherry, with a transverse furrow, shining smooth, of a dark violet black color.

8. LYCIUM, Linn. False Jessamine.

From *Lycia*, the native country of the original species.

Calyx 2 to 5-cleft, short. Corolla tubular; *limb* mostly 5-lobed, spreading; *orifice* closed by the beard of the filaments. Stamens 4 to 5, exserted. Berry 2-celled; *seeds* several, reniform.—*Shrubs, with the branches ending in spinose points and often with axillary spinose and axillary solitary flowers, or in pairs.*

L. Barbarum, Linn. *Matrimony Vine.*

Stem angular, with long pedunculous branches, somewhat spiny; *leaves* often fasciculate, lanceolate; *calyx* mostly 3-cleft. Native of Barbary, cultivated and nearly naturalized. A handsome shrub growing to the height of 8 to 12 feet, with long, slender, trailing or hanging branches, which overspread walls, &c., with a thick tangled mass. *Leaves* smooth, 3 times as long as wide. *Flowers* greenish-purple. *Berries* orange red.

9. CAPSICUM, Tourn. Cayenne Pepper.

Gr. *kapto*, to bite; from the acridity of the fruit.

Calyx erect, 5-cleft, persistent. Corolla rotate, with a very short tube, and plaited 5-lobed limb. Stamens 5, with converging anthers. Fruit a juiceless berry, 2 to 4-

celled, many-seeded.—*A large genus of herbaceous or shrubby plants, pervaded by a hot and pungent principle, with the leaves often in pairs, and axillary solitary peduncles.*

C. ANNUUM, L. *Red Pepper. Cayenne Pepper.*

Stem herbaceous, angular, branching above; *leaves* ovate, acuminate, entire, petiolate, smooth; *peduncles* axillary, smooth; *calyx* angular, with short, acute lobes; *corolla-lobes* spreading, longer than the stamens; *berry* oblong or subglobose. Native of South America. Ann. Cultivated in gardens for its stimulating fruit, which is well known. *Stem* 1 to 2 feet high. *Flowers* solitary, on crowded peduncles, of a greenish-white color.

10. PETUNIA, Juss.

The Brazilian name is *petun*, Latinized, *petunia*.

CALYX-TUBE short, the limb, 5-cleft, leafy. COROLLA funnel-form, with a cylindric tube; *limb* in 5, unequal, plaited lobes. STAMENS 5, unequal, included, arising from the middle of the corolla-tube. CAPSULE 2-valved, many-seeded.—*Herbs, with simple leaves, and axillary, solitary showy flowers.*

1. P. NYCTAGINIFLORA. *White Petunia.*

Diffuse; clothed with clammy hairs; *lower leaves* alternate, ovate, obtuse, hairy; *floral leaves* sessile, cordate-ovate, opposite; *corolla-tube* cylindric, 3 or 4 times longer than the spatulate sepals, limb flat, spreading. A handsome border flower, native of Brazil. *Stem* 1 to 3 feet long. *Leaves* 2 to 3 inches long

2. P. VIOLACEA, L. *Purple Petunia.*

Stem weak, viscid-pilose, prostrate; *leaves* ovate, acute, on shor t petioles; *corolla* ventricose, with ovate, acute segments. Native of Brazil. A handsome trailing or climbing plant, quite popular in cultivation. Whole plant clothed with clammy hairs. *Stems* several from the same root, simple or somewhat branched, 2 to 3 feet long. *Leaves* 1 to 2 inches long, fleshy, nearly smooth beneath. *Peduncles* as long as the leaves. *Corolla* bright purple, 1 inch or more broad, upper segments smallest. These two species are found to hybridize freely, and the union of the two produces a great number of beautiful varieties, such as violet, white and purple, flesh color, &c., some of which are highly fragrant.

ORDER 80. GENTIANACEÆ.—*Gentian Family.*

Smooth herbs, with a colorless bitter juice, mostly opposite sessile entire leaves without stipules, regular flowers with the stamens as many as the lobes of the corolla, mostly twisted in æstivation, a 1-celled ovary with 2 parietal placentæ; the fruit a 2-valved many-seeded capsule.—CALYX persistent. COROLLA mostly withering-persistent, the stamens inserted on its tube.

1. SABBATIA, Adans. AMERICAN CENTAURY.

Dedicated to *Sabbati*, an early Italian botanist.

CALYX 5 to 12-parted, the divisions slender. COROLLA

5 to 12-parted, wheel-shaped. STAMENS 5 to 12, with erect, at length recurved anthers. STYLE 2-parted, slender, with spiral divisions. CAPSULE 1-celled, the valves a little introflexed.—*Biennials, with slender stems, and cymose-panicled handsome white or rose-purple flowers.*

1. S. ANGULARIS, Pursh. *Common Centaury.*

Stem square and 4-angled, stiff erect, much branched above; *leaves* ovate, or ovate-heart-shaped, clasping; *calyx-lobes* lance-linear, nearly ½ as long as the corolla; *corolla-lobes* obovate-elliptical.

Dry neglected fields and river banks. July, Aug. *Stem* 12 to [illegible]0 inches high, with opposite many-flowered branches. *Leaves* closely embracing the stem 1 to 2 inches long, ½ to 1½ wide, obscurely 5-nerved. *Flowers* showy 1 to 1½ inch in diameter, deep rose color with a yellowish-green 5-rayed star in the centre.

2. S. GRACILIS, Salisb. *Slender Centaury.*

Stem, branches and *peduncles* very slender, diffuse; *leaves* linear, the lower rather oblong; *calyx-segments* linear-bristle-shaped, about as long as the corolla; *corolla* 5-parted, with elliptic-oblong obtuse lobes.

Wet grounds. July, Aug. *Stem* 10 to 15 inches high, with long diverging branches. *Panicle* terminal, with spreading few-flowered branches. *Flowers* purple, on long peduncles.

3. S. STELLARIS, Pursh. *Star-flowered Centaury.*

Stem weak, nearly round; *leaves* oblong or ovate-lanceolate, the uppermost linear; *calyx-lobes* linear subulate, about half as long as the obovate lobes of the corolla.

Brackish meadows. Aug., Sept. *Stem* 12 to 18 inches high, slightly angular, dichotomously branched; *branches* elongated, 1-flowered. *Leaves* somewhat fleshy 1 to 2 inches long, sessile. *Flowers* bright purple-rose-color, with a yellow star in the centre, edged with crimson.

4. S. CHLOROIDES, Pursh. *Large-flowered Centaury.*

Stem slender, weak, nearly round; *leaves* oblong-lanceolate, erect; *flowers* 7 to 12 parted; *sepals* linear, shorter than the elliptical-lanceolate lobes of the corolla.

Border of brackish ponds. July—Sept. *Stem* 2 to 3 feet high, loosely panicled above, with few, 1-flowered branches. *Leaves* 1 to 1½ inch long, opposite, entire, smooth, closely sessile, acute. *Corolla* 1½ to 2 inches in diameter, bright purple, with a yellow base, segments spatulate, rounded at end.

2. ERYTHRÆA, Pers. CENTAURY.

Gr. *eruthros*, red; from the color of the flowers.

CALYX 4 to 5-parted, the divisions slender. COROLLA funnel-form, with a slender tube and a 4 to 5-parted limb, which in withering twists on the pod. STAMENS 5, rarely 4; *anthers* after flowering spirally twisted. STYLE slender, single; *stigma* capitate or 2-lipped.—*Low and small branching annuals with subangular stems somewhat cuneate leaves, and rose purple or reddish cymose flowers.*

E. RAMOSISSIMA, Persoon, var. PULCHELLA, Griseb.

Low; *stem* simple below, 2-forked branched above; *leaves* ovate-oblong or oval;

flowers all on short pedicels; *corolla-tube* thrice as long as the elliptical-oblong lobes.

Wet meadows or shady places; rare; probably introduced. July. *Stem* 2 to 6 inches high, many times forked above and forming a diffuse cyme. *Leaves* ⅛ to ⅔ inch long, ¼ inch wide, closely sessile. *Corolla* bright purple, *tube* yellowish-green, slender, persistent and withering on the capsule.

3. BARTONIA, Muhl. (CENTAURELLA, Michx.)

Dedicated in the year 1801, to the late *Prof. Barton*, of Philadelphia.

CALYX 4-parted. COROLLA deeply 4-cleft, without glands fringes or folds. STAMENS 4, short. STIGMA thick, glandulous and partly bifid. CAPSULE oblong, pointed, 1-celled, 2-valved, many-seeded.—*Small annual or biennial erect herbs, with slender stems awl-shaped greenish scale like leaves, and small yellowish white peduncled flowers.*

B. TENELLA, Muhl. *Small-flowered Bartonia. Screw-stem.*

Stem smooth, branched above, *branches* mostly opposite, 1 to 3-flowered; *leaves* awl-shaped, minute; *corolla* as long as the calyx; *style* very short.

Open woods and damp grounds. Aug., Sept. *Stem* 3 to 10 inches high, square, often twisted. *Peduncles* opposite or terminal, simple or branched. *Flowers* small greenish white, on the ends of the branches. *Stamens* inserted in the clefts of the corolla. CENTAURELLA MOSERI, Griseb., is only a variety with the scales and peduncles mostly opposite.

4. GENTIANA, Linn. GENTIAN.

From *Gentius*, king of Illyria, who discovered the tonic virtues of this genus.

CALYX 4 to 5-cleft. COROLLA 4 to 5-lobed, regular, mostly with intermediate plaited folds, which bear appendages at the sinuses. STAMENS 4 to 5, inserted upon the tube of the corolla, short. STYLE short or none; STIGMAS 2, persistent. CAPSULE oblong, 2-valved, many-seeded.—*Herbs of various habits, with opposite leaves, and solitary or cymose showy flowers.*

* *Corolla without crown or plaited folds; annual.*

1. G. QUINQUEFLORA, Lam. *Five-flowered Gentian.*

Stem 4-angled, slender, branched; *leaves* ovate lanceolate, somewhat heart-shaped and clasping at the base, 3 to 7-nerved, minutely pointed; *corolla-lobes* triangular-ovate, bristle-pointed, about ¼ as long as the slender obconical tube, the tube 4 times as long as the subulate sepals.

Hillsides and pastures. Aug., Sept. *Stem* about 1 foot high, with the branches racemed or panicled, about 5-flowered at the summit. *Flowers* about 1 inch long, light purplish-blue.

** *Corolla with plaited folds; perennials.*

2. G. SAPONARIA, L. *Soapwort Gentian.*

Stem erect or ascending, often roughish above; *leaves* ovate-lanceolate, oblong or lance-obovate, with rough-margins, narrowed at the base; *calyx-lobes* linear or spatulate, acute, about ½ as long as the corolla; *corolla* club-bell-shaped, with roundish-ovate, mostly obtuse, erect or converging lobes, which are longer than the 2-cleft and minutely-toothed appendages; *anthers* united.

Meadows and sides of streams, common. Sept., Oct. A very variable species, embracing several varieties and nominal species, 12 to 18 inches high, simple, erect, smooth, with opposite smooth leaves. *Flowers* 1½ inch long, erect, bright blue, subsessile in branches at the top of the stem, and often solitary in the upper axils.

3. G. OCHROLEUCA, Frœl. *Yellowish-White Gentian.*

Stem ascending, mostly smooth; *leaves* obovate oblong, the lowest broadly obovate, obtuse, the upper ones lanceolate, all nerved at the base; *flowers* in a dense terminal cluster; *calyx-lobes* linear, unequal, longer than the tube; *corolla* club-shaped, apex connivent or slightly expanding, lobes ovate, obtuse, the folds entire, acute short; *anthers* free.

Dry grounds, rare. Sept., Oct. *Stem* 9 to 15 inches high, simple, stout. *Leaves* clasping or sessile, 2 to 4 inches long, ¾ to 1½ wide. *Flowers* 2 inches long, ¾ inch thick. *Corolla* open at top, greenish-white, painted inside with green veins and lilac-purple stripes.

4. G. ALBA, Muhl. *Whitish Gentian.*

Stems upright, stout, very smooth; *leaves* ovate-lanceolate from a heart-shaped closely clasping base; *calyx-lobes* ovate, shorter than the top-shaped tube, and much shorter than the tube of the corolla; *corolla* inflated club-shaped, at length open, the short and broad ovate lobes nearly twice as long as the toothed appendages; *anthers* at first united; *capsule* nearly included.

Glades and low grounds. Aug. *Stem* 12 to 18 inches high, with the flowers closely sessile and much crowded in a dense terminal cluster, and sometimes also clustered in the upper axils. *Calyx-lobes* reflexed-spreading. *Corolla* white more or less tinged with greenish or yellowish. This has generally been confounded with G. ochroleuca, but Prof. Gray considers it a very distinct species, on whose authority I have here inserted it, as indiginous to this State.

* * * *Corolla 4-cleft, fimbriate on the margins; annual or biennial.*

5. G. CRINITA, Frœl. *Fringed Gentian.*

Stem erect, branched above; *branches* elongated, 1-flowered; *leaves* lanceolate or ovate-lanceolate, with a partly heart shaped or rounded base; *lobes* of the 4-cleft calyx unequal, ovate and lanceolate; *corolla-tube* bell-shaped, the *limb* 4-parted with wedge obovate lobes, strongly fringed around the summit.

Low grounds and hillsides. Sept., Oct. A beautiful species 6 to 12 inches high, round and smooth, with long branches slightly curved at the base, becoming erect and straight, each bearing 2 leaves at the middle and a single flower at the top. *Leaves* 1 to 2 inches long, ¼ to ½ inch wide, broadest at the base. *Flowers* 2 inches long, sky blue, finely fringed on the margin, expanding in sunshine.

5. MENYANTHES, Tourn. BUCKBEAN.

Gr. *men*, month, and *anthos*, a flower; because the plant blossoms about that length of time.

CALYX 5-parted. COROLLA short funnel-form, 5-parted, deciduous; LIMB spreading, 5-lobed, equal, white, bearded within. STAMENS 5. STYLE slender, persistent. STIGMA 2-lobed. CAPSULE 1-celled, bursting somewhat irregularly, many seeded.—*A perennial herb, with a thickish creeping rootstock, sheathed by the membraneous bases of the long petioles, which bear 3 oval or oblong leaflets at the summit, and white or slightly reddish flowers, racemed on the naked scape.*

M. TRIFOLIATA, L. *Marsh Trefoil. Buckbean.*

Leaves trifoliate; *leaflets* obovate; *peduncles* long naked; *sepals* obtuse, ⅓ as long as the corolla: *petals* acute, about as long as the stamens.

Bogs, margins of ponds. A fine plant arising from large, black roots, descending deep into the boggy earth. *Stem* 8 to 12 inches high, round. *Flowers* white or flesh-color, beautifully fringed with soft hairs at the base and in the tube of the corolla.

6. OBOLARIA, Linn. PENNYWORT.

Gr. *obolos*, a small coin, with which the leaves of this plant are compared.

CALYX of 2 spatulate spreading sepals, resembling the leaves. COROLLA tubular-bell-shaped, withering-persistent, 4-cleft, the lobes oval-oblong, or sometimes spatulate. STAMENS 4, inserted at the sinuses of the corolla, short. STYLE short persistent: STIGMA 2-lipped. CAPSULE ovoid, 1-celled, 2-valved, many-seeded.—*A low and very smooth purplish green perennial, with opposite wedge obovate leaves, and whitish or purplish terminal and axillary flowers solitary or in clusters of* 3.

O. VIRGINICA, L. *Virginian Pennywort.*

Stem simple or with a few opposite branches above; *leaves* cuneate-obovate or roundish-rhomboidal, sessile and decurrent at base.

Rich woods, rare. April, May. *Stem* 4 to 8 inches high, often in clusters. *Corolla* pale-purplish or whitish, longer than the stamens.

ORDER 81. APOCYNACEÆ.—*Dogbane Family.*

Plants with milky acrid juice, entire chiefly opposite leaves without stipules, regular 5-merous and 5-androus flowers, with the 5 lobes of the corolla convolute and twisted in the bud.—CALYX entirely free from the 2 ovaries, persistent. FILAMENTS distinct: *pollen* granular, globose or 5-lobed. FRUIT a pair of follicles, rarely one of them abortive. SEEDS numerous, amphitropous. Chiefly tropical plants.

1. APOCYNUM, Tourn. DOGBANE.

Gr. *apo*, away, and *kuon*, a dog; to which the plant was thought to be poisonous

CALYX 5-parted, with acute lobes. COROLLA bell-shaped, 5-cleft, with 5 triangular appendages in the throat opposite the lobes. STAMENS 5, inserted on the base of the corolla: *anthers* arrow-shaped, longer than the filaments: *filaments* slightly adherent to the 2-lobed stigma by their inner face. FRUIT of 2 long and slender follicles.—*Perennial herbs, with opposite entire mucronate leaves, and small pale flowers in terminal and axillary cymes.*

1. A. ANDROSÆMIFOLIUM, L. *Dog'sbane.*

Smooth, branched above, the branches diverging; *leaves* ovate distinctly petioled; *cymes* loose, spreading, mostly longer than the leaves; *corolla* open bell-shaped, with revolute lobes, the tube much longer than the calyx.

Borders of woods and fencerows, common. June, July. *Stem* 2 to 3 feet high, erect reddish. *Leaves* 2 to 3 inches long and ⅔ as wide, dark green above, paler beneath, on petioles ¼ inch long. *Corolla* ⅓ inch broad, white striped with red, with 5 acute, spreading segments.—Varies, also, with the leaves downy underneath.

2. A. CANNABINUM, L. *Indian Hemp.*

Stem and branches upright or ascending; *leaves* varying from oblong, oval ovate to heart-shaped; *cymes* close, many-flowered, erect, usually shorter than the leaves; *corolla* with nearly erect lobes, the tube about as long as the lanceolate lobes of the calyx.

Open woods and river banks, common. July, Aug. *Stem* 2 to 3 feet high, generally dividing above into long, slender branches. *Leaves* 1½ to 4 inches long, ¼ to ½ as wide. Var. 1. *glaberrimum*. DC. *Leaves* oblong-lanceolate, on short petioles, smooth, obtuse or rounded. Var. 2. *pubescens*, DC. *Leaves* oblong, oval, or ovate, downy underneath or on both sides, as well as the cymes. Var. 3. *hypericifolium*. *Leaves* more or less heart shaped at the base, on very short petioles, mostly smooth. (A. hypericifolium. Ait.) *Flowers* small, with lanceolate acute sepals. *Corolla* whitish with straight obtuse segments.

2. VINCA, Linn. PERIWINKLE.

Lat. *vinculum*, a band, from the long twining branches.

CAPSULE salver-form, contorted, border 5-cleft, the lobe oblique, orifice 5-angled; 2 glands at the base of the ovary. CAPSULE follicular, erect, fusiform; *seeds* oblong.—*Upright or trailing shrubs, with evergreen leaves and showy flowers.*

1. V. MINOR, L. *Lesser Periwinkle. False Myrtle.*

Stem procumbent, trailing; *leaves* elliptic-lanceolate, smooth on the margins, thick; *flowers* pedunculate; *sepals* lanceolate. A handsome evergreen, flowering in May. Native of Europe. *Stems* several feet in length, round, smooth and leafy. *Leaves* opposite, smooth and shining, about an inch long. *Flowers* solitary, axillary, alternate, blue, violet and white.

2. V. MAJOR, L. *Greater Periwinkle.*

A beautiful shrub, common in cultivation, native of Europe. *Stem* 1 to 2 feet high, with numerous, slender, straggling branches, very leafy, forming light masses of evergreen foliage. *Leaves* 1 to 2 inches long, rounded or somewhat heart-shaped at base. *Flowers* blue, pink and white, blossoming nearly all seasons.

ORDER 82. ASCLEPIADACEÆ.—*Milkweed Family.*

Plants with milky juice and opposite or whorled rarely scattered entire leaves, regular 5-merous, 5-androus flowers, with a valvate corolla, and singular connection of the anthers with the stigma, the cohesion of the pollen masses into wax-like masses, &c., as explained under the typical genus.

1. ASCLEPIAS, Linn. MILKWEED. SILKWEED.

The Greek name of *Æsculapius*, to whom this genus is dedicated.

CALYX small, 5-parted, persistent, spreading. COROLLA deeply 5-parted, the divisions lanceolate reflexed, deciduous. CROWN of 5 hooded lobes (nectaries) seated on the tube of stamens, each containing a horn-like incurved process. STAMENS 5, inserted on the base of the corolla; FILAMENTS united into a tube which incloses the pistil; ANTHERS adherent to the stigma, with 2 vertical cells opening lengthwise tipped with a membranaceous appendage, each cell containing a flattened waxy pollen-mass. STIGMA depressed, 5-angled, covering 2 ovaries. FOLLICLES 2, one of them often abortive, inflated, smooth or muricate. SEEDS furnished with a long tuft of silky hairs at the hilum.—*Perennial upright herbs, with thick and deep roots usually transversely veined leaves, and terminal or mostly lateral peduncles between the petioles bearing simple many-flowered umbels.*

* *Leaves opposite.*

1. A. CORNUTI, Decaisne. *Common Milkweed or Silkweed.*

Stem nearly simple, large and stout; *leaves* ovate-elliptical, with a slight point, spreading, petiolate, minutely velvety-downy underneath; *umbel* nodding; divisions of the corolla ovate; hoods of the crown ovate, obtuse, with a lobe or tooth on each side of the claw-like horn; *follicles* muricate.

Rich soil, fields, roadsides, &c., common. July. A coarse, very milky plant, 3 to 4 feet high. *Leaves* 4 to 8 inches long, 2 to 3 inches wide, tapering at both ends, pale. *Umbels* several, dense, globose, each of 20 or more sweet-scented flowers. *Corolla* pale-purple, about ¼ as long as the pedicels, reflexed, leaving the crown quite conspicuous.

2. A. PHYTOLACCOIDES, Ph. *Polk-leaved Silkweed.*

Stem simple, erect, smooth; *leaves* broadly ovate, or the upper oval-lanceolate pointed at both ends, short petioled, smooth or slightly downy underneath; *pedicels* loose and nodding, numerous, elongated, slender; divisions of the corolla ovate oblong, heads of the crown truncate, the margins 2-toothed at the summit, the horn with a long projecting point; *follicles* minutely downy.

Low shady grounds, rather common. June. *Stem* 3 to 5 feet high, above marked with 2 opposite lines of minute pubescence. *Leaves* 5 to 8 inches long, and nearly ½ as wide. *Umbels* near the top, on lateral peduncles 4 to 6 inches long, with 10 to 20 large flowers, on pedicels 2 inches long. *Petals* green. *Crown* flesh-colored.

3. A. PURPURASCENS, L. *Purple Milkweed.*

Stem simple, erect, with 2 pubescent lines; *leaves* elliptical or ovate-oblong, the lower mucronate, the upper acuminate, minutely velvety downy underneath, smooth above, contracted at base into a short petiole; *pedicels* shorter than the mostly terminal peduncle; divisions of the corolla lance-ovate; hoods of the crown oblong; the horn broadly falcate, with a narrow and broadly inflexed horizontal point; *follicles* smooth.

Border of woods and thickets, not common. July. *Stem* 2 to 3 feet high, rather slender. *Leaves* pale and downy beneath, the midvein purple. *Flowers* in terminal, erect umbels, with a small green calyx, and dark purple corolla with reflexed segments.

4. A. VARIEGATA, L. *Variegated Milkweed.*

Nearly smooth; *stem* simple, erect; *leaves* ovate, oval or obovate, somewhat wavy, mucronate, contracted into a short petiole; *pedicels* and *peduncles* short, downy; *corolla segments* ovate; hoods of the crown orbicular, entire, the horn broad-falcate, with a horizontal point; *follicle* slightly downy.

Dry woods. July, Aug. *Stem* 3 to 4 feet high. *Leaves* somewhat acuminate, on pubescent petioles. *Umbels* 20 to 40-flowered, mostly globose. *Corolla* and *crown* white, the latter with a band of purple around the base.

5. A. QUADRIFOLIA, Jacq. *Four-leaved Milkweed.*

Nearly smooth; *stem* simple, slender; *leaves* ovate or ovate-lanceolate, petioled, mostly acuminate, the middle ones in whorls of four; *pedicels* capillary; *corolla segments* oblong; *hoods* of the crown elliptical ovate; *horn* very short, incurved; *follicle* linear-lanceolate, smooth.

Dry woods and hills; common. June. *Stem* 1 to 2 feet high. *Leaves* thin, 2 to 4 inches long, the upper and lower ones opposite. *Umbels* 2 to 5, on slender peduncles 1 to 1½ inch long. *Flowers* small, white or purplish, fragrant.

6. A. OBTUSIFOLIA, Michx. *Wavy-leaved Milkweed.*

Smooth and glaucous; *stem* simple, erect; *leaves* oblong or ovate-elliptical, very obtuse, mucronate, sessile, somewhat clasping by a heart shaped base, the margins wavy; *umbels* terminal, many-flowered; hoods of the crown truncate and somewhat toothed at the summit, shorter than the slender subulate horn; *follicle* smoothish.

Sandy woods and fields, rather common. July. *Stem* 2 to 3 feet high, bearing a single (rarely 2) long peduncled terminal umbel of 30 to 40 large reddish-green flowers. *Leaves* much waved on the margin, 4 to 5 inches long, ½ as wide. *Corolla* light purple. *Crown* nearly white, the segments large.

7. A. RUBRA, L. *Red-flowered Milkweed.*

Smooth, slender, erect; *leaves* ovate-lanceolate or oblong, acuminate, subcordate or rounded at base, on very short petioles; divisions of the corolla lanceolate, acute; hoods of the crown oblong, acutish, with an awl-shaped horn.

Low grounds, rare. July. *Stem* 1 to 2 feet high, with a pubescent line on one side, bearing 1 to 3 few-flowered umbels at the naked summit of the stem. *Leaves* 2 to 4 inches long, rough-ciliate, in remote pairs. *Flowers* reddish purple, tinged with orange.

8. A. INCARNATA, L. *Rose-colored Silkweed.*

Stem erect, branching above; *leaves* oblong-lanceolate, acute or pointed, obtuse at the base, distinctly petioled; *umbels* many-flowered, erect, mostly terminal, often in opposite pairs; divisions of the corolla ovate; *horns* awl-shaped, curving inwards.

Wet places, common. July, Aug. *Stem* 2 to 3 feet high, very leafy, with 2 hairy lines above and on the branches and peduncles. *Leaves* 3 to 6 inches long, ½ to 1½ wide, tapering to a very acute point on petioles ¼ inch long. *Umbels* close, 2 to 6 together at the top of the stem or branches, on a peduncle 2 inches long. *Flowers* small. *Corolla* reddish-purple. *Crown* flesh-color.

9. A. TUBEROSA, L. *Butterfly Weed. Pleurisy Root.*

Roughish-hairy; *stems* erect or ascending, very leafy, with spreading branches; *leaves* varying from linear to oblong-lanceolate, sessile or slightly petioled; *umbels* numerous, often forming terminal corymbs; hoods of the crown narowly-oblong, scarcely longer than the slender awl-shaped horns; *follicles* hoary.

Dry hills and fields, common. June—Aug. *Root* large, tuberous. *Plant* 1 to 2 feet high, leafy to the summit, usually with numerous corymbed umbels of showy orange flowers on short peduncles. *Leaves* sometimes broad and cordate, at others linear and somewhat tapering at base. *Corolla* greenish-orange. *Crown* bright-orange. Medicinal.

10. A. VERTICILLATA, L. *Whorled Milkweed.*

Smoothish: *stems* slender, simple or sparingly branched, minutely hoary in lines, very leafy to the summit; *leaves* mostly whorled, narrow-linear, revolute on the margin; *umbels* small lateral and terminal; hoods of the crown roundish-oval, half as long as the hooked claw-shaped horns.

Dry hills. June—Sept. *Stem* 1 to 3 feet high, very slender, often a little branched at the summit. *Leaves* 2 to 3 inches long, scarcely 1 line wide, 3 to 6 in a whorl, or the lowest and uppermost nearly opposite. *Flowers* small, greenish-white, in numerous umbels about 1 inch in diameter.

ACERATES, Ell. *Hoods of the crown destitute of a horn;* whence the name, from *a*, privative and *keras,-atos*, a *horn.*

11. A. VIRIDIFLORA, Raf. *Green-flowered Milkweed.*

Downy-hoary; *stems* low and stout, ascending; *leaves* oval, ovate and obovate or sometimes almost linear, slightly petioled, mucronate, acute or obtuse, thick, at length smoothish; *umbels* nearly sessile, densely many-flowered, globose, lateral; *crown* oblong, strictly erect, sessile at the base of the tube of filaments, shorter than the anthers.

Dry hills and sandy fields, common. July—Sept. *Stem* 12 to 18 inches high, sometimes clustered. *Leaves* 2 to 3 inches long, thick and coriaceous, very variable in form. *Umbels* 2 to 4, subterminal on short thick hairy peduncles. *Flowers* greenish, when expanded about the length of the pedicel.

2. GONOLOBUS, Michx.

Gr. *gonos*, an angle, and *lobos*, a pod, from the ribbed follicles.

CALYX 5-parted, spreading. COROLLA 5-parted, wheel-shaped, sometimes reflexed-spreading. CROWN a small and fleshy wavy-lobed ring in the throat of the corolla. ANTHERS horizontal, partly concealed under the flattened stigma, opening transversely. POLLEN-MASSES 5 pairs, horizontal. FOLLICLES 2, turgid, somewhat ribbed. SEEDS comose.—*Twining herbaceous or shrubby plants, with opposite heart-shaped leaves, usually hairy, and racemed or corymbed greenish or purplish flowers, on peduncles rising from between the petioles.*

1. G. HIRSUTUS, Michx. *Hairy Gonolobus.*

Minutely pubescent; *leaves* ovate heart-shaped, somewhat obtuse or pointed; *peduncles* few-flowered, shorter than the petioles; *pedicels* very short; *bractlets* awl-shaped; *lobes* of the corolla oblong minutely softly-hairy outside; *follicles* covered with spine-like soft processes.

Rich river banks. Western part of the State. June, July. *Stem* trailing and climbing 3 to 4 feet long, the younger branches very hairy. *Leaves* slightly auriculate at base. *Umbels* axillary, 3 to 4-flowered. *Flowers* dark purple.

2. G. MACROPHYLLUS, Michx. *Large-leaved Gonolobus.*

Stem hirsute with long hairs; *leaves* broadly ovate-heart-shaped, pointed; *peduncles* and *pedicels* longer than the petioles; *bractlets* linear; *lobes* of the corolla linear or narrowly oblong, downy outside; *follicles* ribbed and angled.

Shady banks, near Philadelphia, *Barton*. Chester Co., Darlington. July. *Stem* twining several feet long. *Leaves* 3 to 6 inches wide. *Flowers* purple and greenish, fœtid, in loose cymose umbels.

ORDER 83. JASMINACEÆ.—*Jasmine Family.*

Shrubs, often with twining stems, opposite or alternate mostly compound leaves and white or yellow, mostly fragrant flowers in opposite corymbs. CALYX divided or toothed, persistent. COROLLA regular, salver-form, the limb in 5 to 8 divisions. STAMENS 2, arising from the corolla and included within its tube. OVARY free, 2-celled, each cell with 1 erect ovule. STYLE 1; STIGMA 2-lobed. FRUIT a double berry, or a capsule seperable into 2, 2-seeded.

JASMINUM, Linn. JASMINE.

Gr. *iasme*, perfume; from the fragrance of the flowers.

CALYX tubular, 5 to 10-cleft. COROLLA salver-form; *tube* long; *limb* flat, 5 to 10-cleft. FRUIT a double berry; *seeds* 2, solitary, ariled.—*Bushy or climbing shrubs, with opposite compound leaves on articulated petioles, and white or yellow mostly fragrant flowers in paniculate corymbs.*

1. J. FRUTICANS, L. *Yellow Jasmine.*

Smooth, erect; *branches* angular; *leaves* alternate trifoliate, rarely simple; *leaflets* curved; *flowers* few, subterminal; *calyx segments* subulate; *corolla-tube* twice longer than the calyx, limb of 5, obtuse lobes. Native of South Europe. *Stem* 3 feet high, bushy. *Flowers* yellow, inodorous, the tube about ½ inch long.

2. J. OFFICINALE, L. *White Jasmine. Common Jasmine.*

Smooth, scarcely climbing; *branches* subangulate; *leaflets* 3 to 7, lanceolate, acuminate; *panicles* terminal, few-flowered, corymbose; *corolla-tube* twice longer than the calyx. Native of Asia. A beautiful and much cultivated species, several feet high, with fragrant white flowers.

ORDER 84. OLEACEÆ.—*Olive Family.*

Trees or shrubs, with opposite and pinnate or simple leaves, a 4-cleft or sometimes obsolete calyx, a regular 4-cleft or nearly 4-petalous corolla, sometimes apetalous, 2, or rarely 3, stamens, and a 2-celled ovary with 2 suspended ovules in each cell. FRUIT drupaceous, baccate or samaræ, usually 1-seeded by abortion. SEEDS anatropous, with a large straight embryo usually in hard fleshy albumen.

1. LIGUSTRUM, Tourn. PRIVET.

The classical name.

CALYX minutely 4-toothed, deciduous. COROLLA funnel-form, 4-lobed; *lobes* ovate, obtuse. STAMENS 2, on the tube of the corolla, included. STYLE very short; *stigma* 2-cleft. BERRY globose, 2-celled, 2 to 1-seeded.—*Shrubs with simple entire leaves on short petioles, and small white flowers in terminal thyrsoid panicles.*

L. VULGARE, L. *Privet. Prim.*

Leaves lanceolate and obovate, acute or obtuse, smooth, thickish; *panicles* dense, terminal.

Introduced from Europe, used for low hedges; naturalized. May, June. A smooth shrub 5 to 10 feet high, with wand-like opposite branches, and smooth dark green leaves 1 to 2 inches long, ½ as wide. *Berries* black, globose.

2. CHIONANTHES, Linn. FRINGE-TREE.

Gr. *chion*, snow, and *anthos*, blossom: alluding to the light snow-white clusters of flowers.

CALYX very small, 4-parted, persistent. COROLLA of 4 long and linear petals, barely united at the base. STAMENS 2, very short, on the base of the corolla. STYLE very short; *stigma* notched. DRUPE fleshy, globular, becoming 1-celled and 1-seeded. — *Low trees or shrubs, with entire petioled leaves, and delicate flowers in loose and drooping graceful racemes or panicles.*

C. VIRGINICA, L. *White Fringe-tree.*

Leaves oval, oblong, or obovate-lanceolate, smoothish or rather downy, veiny; *flowers* on slender pedicels.

Chester Co., Darl. Union [illegible] River banks and mountains, rare. June. A small very ornamental tr[illegible] high with opposite branches. *Flowers* white in pendulous panicles; [illegible] narrowly linear, acute, rarely 5 to 6 in number. *Drupe* [illegible]

3. SYRINGA, Linn. LILAC.

Gr. *syrinx*, a [illegible] pipe; from the use once made of its branches.

CALYX small, with erect teeth. COROLLA salver-form with the tube several times longer than the calyx; *limb* cleft into 4 deep [illegible], spreading segments. STAMENS 2, short, included within the tube. CAPSULE 2-celled, 2-valved. — *Oriental, flowering shrubs, with simple, entire leaves, and mostly fragrant thyrsoid flowers.*

1. S. VULGARIS, L. *Common Lilac.*

Leaves cordate-ovate, entire, smooth, green on both sides; *flowers* thyrse [illegible] corolla somewhat concave. Native of Hungary. There are sev[illegible] purplish-blue, lilac-purple and white flowers.

2. S. PERSICA, L. *Persian Lilac.*

[illegible] lanceolate, acute, smooth, green on both sides, sometimes pi[illegible] corolla flattish. Native of Persia. May. A beautiful flow[illegible] smaller than the first, with wand-like branches in thyrses of white [illegible]

4. FRAXINUS, Tourn. ASH.

Gr. *phraxis*, separation, from the facility with which the wood [illegible]

FLOWERS polygamous or diœcious. CALYX small, 4-cleft or obsolete. PETALS 4, slightly cohering in pairs at the base, sometimes only 2 oblong or linear, often entirely wanting in our species. STAMENS 2, rarely 3 to 4. STYLE single; *stigma* 2-cleft. FRUIT a 1 to 2-celled samara, flattened, winged at the apex, 1 to 2-seeded.—*Trees, with petioled unequally pinnate leaves, and small flowers in crowded panicles or racemes from the axils of the former years growth.*

* *Calyx present; corolla wanting.*

1. F. AMERICANA, L. *White Ash.*

Leaflets 7 to 9, stalked, oblong-ovate, pointed, nearly entire, glaucous underneath, at length smooth; *samara* spatulate-linear, obtuse, with a long narrowed base.

Rich woods, common. April, May. The white ash is exceeded by few trees in the beauty and magnitude of its proportion. The trunk arises often to the height of 40 feet without a branch and then expands into a regular summit of about the same additional height. *Bark* of the trunk gray, furrowed and cracked, that of the branchlets greenish-gray, smooth. *Leaves* 1 foot or more long. *Flowers* in loose panicles.

2. F. PUBESCENS, Walt. *Red Ash.*

Leaflets 7 to 9, lanceolate or ovate-lanceolate, pointed, somewhat serrate, velvety-downy underneath, as well as the petioles and young branchlets; *samara* narrowly lanceolate-spatulate, obtuse, usually with an obtuse point, tapering at the base.

Woods along streams, very common. May. The red ash resembles the last species, so as often to be confounded with it. It rises 60 feet high with a straight trunk, covered with bark of a deep brown color. *Leaves* at length reddish underneath. The wood is less valuable than that of the white ash.

3. F. JUGLANDIFOLIA, Lam. *Swamp Ash.*

Branches smooth; *leaflets* 7 to 9, ovate, serrate, smooth, somewhat downy on the veins underneath, stalked; *samara* wedge-lanceolate, obtuse, scarcely acuminate at the base.

Wet woods. May. A small tree 15 to 25 feet high, with greenish branchlets *Leaves* 10 to 15 inches long, green on both sides, with a glaucous hue underneath *Flowers* greenish. *Fruit* much smaller than in the other species.

** *Calyx and corolla both wanting.*

4. F. SAMBUCIFOLIA, Lam. *Black Ash. Water Ash.*

Leaflets 9 to 11, sessile by an obtuse base, elliptical-lanceolate, pointed, more or less hairy on the veins beneath; *samara* elliptical-oblong, very obtuse at both ends.

River banks and swamps. April. A slender tree 40 to 60 feet high, with a very tough wood. *Branches* ash-color, with dark dots. *Leaves* 9 to 16 inches in length, smooth above, and red-downy on the veins beneath.

DIVISION III.

APETALOUS EXOGENOUS PLANTS.

COROLLA none; the floral envelopes consisting of a single series of organs (calyx) only, or sometimes wholly wanting.

ORDER 85. **ARISTOLOCHIACEÆ.**—*Birthwort Family.*

Climbing shrubs or herbs, with alternate simple petioled leaves and perfect axillary, solitary, brown or lurid colored flowers, with the calyx coherent below with the 2-celled ovary, which forms a many-seeded 6-celled capsule or berry in fruit. STAMENS 6 to 12, more or less united with the style: *anthers* adnate, extrorse. SEEDS anatropous, with a minute embryo in fleshy albumen

1. ASARUM, Tourn. ASARABACCA.

An ancient name, thought to be derived from *a.* privative, and *seiron,* bound, because it is rejected from garlands.

PERIANTH bell-shaped; *limb* 3-parted, the tube wholly adherent to the ovary. STAMENS 12; *filaments* awl-shaped, coherent with the apex of the ovary. STYLES united into a short column, bearing 6 radiating crested stigmas at the apex. FRUIT fleshy, globular, crowned with the persistent calyx, many-seeded. *Stemless herbs, with aromatic-pungent creeping rootstocks, bearing a nodding flower close to the ground, between the long petioles of the kidney shaped leaves.*

A. CANADENSE, L. *Wild Ginger. Coltsfoot.*

Downy; *leaves* a terminal pair, broad kidney-shaped; *perianth* woolly, cleft to the base, the segments reflexed.

Hillsides in rich woods. May. *Leaves* 3 to 4 inches wide, on long and hairy petioles. *Flowers* brownish purple inside. The root has an agreeable and aromatic flavor.

2. ARISTOLOCHIA, Tourn. BIRTHWORT.

From the Greek; in allusion to its medicinal virtues.

PERIANTH tubular, the tube variously inflated above the ovary, dilated at the apex and ligulate. ANTHERS 6, subsessile, inserted on the style. STIGMA 3 to 6-parted or lobed. CAPSULE 6-sided, 6-valved, many-seeded. SEEDS flat.—*Twining, climbing, or sometimes upright perennial herbs or shrubs, with alternate leaves and lateral or axillary greenish or lurid-purple flowers.*

1. A. SERPENTARIA, L. *Virginia Snakeroot.*

Herbaceous, low, pubescent; *leaves* ovate or oblong, from a heart-shaped base, or halbert form, mostly acute or pointed; *peduncles* nearly radical; *perianth* strongly bent and inflated at the curvature, the border obtusely 3-lobed.

Rich woods; common near the Allegheny Mountains. July. *Root* consisting of numerous coarse fibres, aromatic-stimulant. *Stem* 8 to 12 inches high, pubescent, geniculate and knotty at the base. *Flowers* purplish-brown, bent like the letter S, inflated at the two ends. *Stigma* 3-lobed.

3. A. SIPHO, L'Her. *Dutchman's Pipe.*

Woody, twining and climbing, smooth; *leaves* round-heart-shaped, slightly downy underneath; *peduncles* solitary, 1-flowered, with a clasping bract; *perianth* ascending curved, contracted at the throat, the border obtusely 3-lobed.

Rich mountain woods, rare. May. *Stem* sometimes 2 inches in diameter, climbing trees. *Leaves* 8 to 12 inches broad. *Perianth* 1½ inch long, brownish. *Stigma* slightly 3-lobed.

ORDER 86. CHENOPODIACEÆ.—*Goosefoot Family.*

Chiefly herbs of homely aspect, more or less succulent, with mostly alternate leaves without stipules or bracts, minute greenish flowers, with the free calyx imbricated in the bud; the stamens about as many as the lobes and inserted opposite them or on their base, a 1-celled ovary becoming a 1-seeded utricle in fruit. CALYX persistent, inclosing the fruit. STYLES 2, rarely 3 to 5. *Flowers* commonly perfect.

1. CHENOPODIUM, Linn. GOOSEFOOT.

Gr. *chen*, a goose, and *pous*, foot, in allusion to the shape of the leaves.

FLOWERS perfect. CALYX 5-parted, obtusely 5-angled, partially enveloping the depressed fruit. STAMENS 5. STYLES 2. UTRICLE membranaceous; SEEDS horizontal, lenticular.—*Smooth mostly annual weeds with petioled triangular or rhomboid toothed or entire leaves often covered with a white mealiness and sessile flowers in small clusters.*

1. C. ALBUM, L. *Lamb's-quarter.*

Stem upright, somewhat branched; *leaves* rhomboid-ovate with a wedge-shaped entire base, coarsely sinuate-toothed; *flowers* in panicled spikes, nearly leafless; *seed* smooth and shining.

Waste grounds, common. July, Aug. A very common plant about gardens, 2 to 3 feet high, covered with a whitish mealiness. *Upper leaves* mostly oblong-linear and entire. *Flowers* numerous small, green, in irregular terminal erect racemes. A greener variety is the C. *viride* of most authors.

2. C. GLAUCUM, L. *Glaucous Goosefoot.*

Stems ascending or prostrate, much branched; *leaves* ovate-oblong, obtuse, sinuate or toothed, mealy-whitened underneath; *racemes* spiked, rather dense, ascending, leafless; *calyx-lobes* not keeled; *seeds* smooth and shining.

Near Philadelphia, rare. July. *Stem* diffuse thick.

3. C. HYBRIDUM, L. *Maple-leaved Goosefoot.*

Stem erect, much branched; *leaves* ovate-heart-shaped at the base, pointed, angled with a few large and distant pointed teeth; *racemes* loosely panicled, spreading, leafless; *calyx-lobes* keeled in fruit.

Waste places, common. July, Aug. *Stem* 2 to 3 feet high, slender, with large and bright green leaves. *Flowers* greenish, ill-scented, in a loose branching cluster.

4. C. URBICUM, L. *Triangular-leaved Goosefoot.*

Stem erect, branching; *leaves* triangular-acute, coarsely sinuate-toothed, the uppermost lance-linear and nearly entire; *racemes* spiked-panicled, erect; *calyx-lobes* not keeled.—Var. *rhombifolium*, Moquin (C. rhombifolium, Muhl,), has rather rhombic leaves with more prolonged teeth.

Not common. June, July. Whole plant yellowish-green, 1 to 2 feet high, branched. *Flowers* small green, in roundish dense clusters.

AMBRINA, Spach. SEED either vertical or horizontal, the embryo not coiled into a complete ring; STYLES often 3.—*Glandular and often pubescent herbs, exhaling an aromatic or balsamic odor.*

5. C. BOTRYS, L. *Jerusalem Oak.*

Stem ascending; *leaves* oblong, obtuse, sinnate pinnatifid, the upper spatulate-lanceolate; *racemes* cymose-panicled, divergent, leafless.

Waste places, common. July—Sept. Whole plant fragrant, 1 to 2 feet high, branched. *Leaves* petioled, with deep sinuses, numerous. *Flowers* green, very numerous, in numerous short axillary racemes.

6. C. ANTHELMINTICA, L. *Wormseed.*

Erect; *leaves* ovate-oblong, narrowed at the base into a petiole, coarsely and unequally cut-toothed or sinuate; *racemes* elongated and spike-like, slender, leafless; *calyx-lobes* not keeled.

Roadsides and waste places. Per. July, Aug. *Plant* 2 feet high, very strong-scented, the branches terminating in long spikes of green, inconspicuous flowers. The seeds yield the well known vermifuge *Worm-seed oil.*

7. C. AMBROSOIDES, L. *Sweet Pigweed. Mexican Tea.*

Erect, much branched; *leaves* oblong, narrowed at the base into a petiole, remotely sinuate-toothed, the upper oblong-linear and entire; *racemes* leafy, dense; *calyx-lobes* somewhat keeled.

Roadsides, common. Aug., Sept. Stem 18 inches high, somewhat pubescent. *Leaves* on short petioles, acute at each end. *Flowers* green in erect spikes.

2. BLITUM, Tourn. BLITE.

The ancient Greek and Latin name of some insipid pot-herb.

FLOWERS perfect. CALYX 3 to 5-parted, becoming juicy and berry-like in fruit. STAMENS 1 to 2. STYLES 2, united. SEEDS vertical, compressed globular.—*Nearly smooth annuals, with petioled triangular or halbert-shaped sinuate-toothed leaves, and mostly capitate-clustered flowers.*

1. B. CAPITATUM, L. *Strawberry Blite.*

Stem ascending, branched; *leaves* triangular and somewhat halbert-shaped, sinuate-toothed; *clusters* simple, interruptedly spiked, the upper leafless; *seed* smooth, with a narrow sharp margin.

Dry rich grounds. June. A weedlike plant about a foot in height. The calyx becomes pulpy and bright red in fruit, when the large clusters appear like strawberries.

2. B. VIRGATUM, L. *Slender Strawberry Blite.*

Stem with spreading branches; *leaves* triangular-hastate, sinuate-toothed; *heads* scattered, lateral.

Fields and wastes places; introduced. June. *Stem* 2 feet in length, spreading or procumbent. *Leaves* 2 to 3 by 1 to 2 inches, coarsely toothed on petioles 1 to 2 inches long. *Flowers* always in axillary clusters, terminal. *Calyx* becoming fleshy and red in fruit.

3. ACNIDA, Mitchell. WATER HEMP.

Gr. *a*, privative, and *knida*, a nettle; for a nettle-like plant which does not sting

FLOWERS diœcious, without bracts. STERILE FLOWERS with 5 membranaceous oblong sepals and 5 short stamens. FERTILE FLOWERS with 3 acute sepals and a 3 to 5-angled ovary bearing 3 to 5 linear revolute stigmas. FRUIT a 3 to 5-angled coriaceous achenia. SEEDS vertical, compressed.—*Smooth and tall annuals, with lanceolate and acuminate entire petioled leaves and clustered sessile flowers crowded in axillary and terminal spikes or panicles.*

A. CANNABINA, L. *Common Water Hemp.*

Leaves elongated-lanceolate, tapering to a long mostly obtuse point; *fruit* acute-angled, smooth.

Brackish swamps, common. July, Aug. *Stem* 3 to 6 feet high, slightly angled. *Leaves* alternate, ribbed, 2 to 5 inches long. *Flowers* small, green, in large axillary and terminal panicles.

4. BETA, Linn. BEET.

Celtic *bett*, red, the usual color of the beet.

CALYX 5-sepaled. STAMENS 5. STYLES 2, very short, erect, with acute stigmas. SEED reniform, embedded in the fleshy calyx—*Biennials, with furrowed stems, alternate leaves, and glomerate green flowers in spikes or paniculate racemes.*

1. B. VULGARIS, L. *Common Beet.*

Lower leaves ovate; *root* fleshy; *flowers* in dense, sessile, axillary clusters. Native of South Europe. Much cultivated for the table. There are several varieties, of which the purple-leaved is the most esteemed for the kitchen, and the green-leaved for extracting sugar.

2. B. CICLA, L. *Scarcity. Mangel-Wurtzel.*

Leaves with very thick veins; *flowers* 3 together. Native of Portugal. *Root-leaves* stalked, those of the stem sessile. *Flowers* green, numerous, in very long spikes. The variety *Scarcity* has very large leaves, with but a small root, used as a salad, &c. The variety *Mangel-Wurtzel* has a very large root, and is much cultivated as food for cattle, for which purpose it is highly prized.

ORDER 87. AMARANTHACEÆ.—*Amaranth Family.*

Herbs, rarely shrubs, with opposite or alternate leaves, without stipules and flowers in heads or spikes usually colored, imbricated with dry and scarious persistent bracts which are usually colored, the sepals very similar. SEPALS 3 to 5. STAMENS 5, or some multiple of 6. OVARY 1, free, 1 or few ovuled. STYLE 1 or none. STIGMAS simple or compound. FRUIT a utricle. SEEDS pendulous.

1. AMARANTHUS, Linn. AMARANTH.

Gr. *a*, not, *maraíno*, to wither, and *anthos*, flower.

FLOWERS monœcious or polygamous, rarely diœcious, 3-bracted. SEPALS 3 to 5. STAMENS 3 to 5, separate: AN-

THERS 2-celled. STYLES or STIGMAS 2 to 3, sometimes 4, threadlike. UTRICLE opening transversely all round, or indehiscent, 1-seeded.—*Chiefly annual weedy herbs, of coarse aspect, with alternate and entire petioled leaves, and minute spike-clustered flowers with green or purple bracts and calyx.*

* *Monœcious: stamens* 3.

1. A. ALBUS, L. *White Cock's-comb.*

Smooth; *stem* upright, angular, with spreading or horizontal branches; *leaves* obovate or spatulate-oblong, pale-green, obtuse or notched; *clusters* axillary, inconspicuous; *bracts* lance-oval-shaped, with spreading spiny tips longer than the calyx.

Open waste places and roadsides, common. Aug. A very homely weed, 1 to 3 feet high. *Leaves* ½ to 2 inches long, somewhat wavy-margined. *Flowers* inconspicuous, concealed among the greenish bracts, in small clusters.

* * *Stamens* 5.

2. A. HYBRIDUS, L. *Hybred Amaranth.*

Roughish-pubescent; *stem* upright, grooved-angled, sparingly branched, or simple; *leaves* ovate and lance ovate; *flowers* crowded in dense compound terminal and axillary naked spikes; *bracts* awl-shaped, nearly bristle-pointed, longer than the flowers.

Waste and cultivated grounds, common. July—Oct. *Stem* 1 to 5 feet high, stout. *Leaves* 2 to 5 inches long, alternate. *Flowers* minute, in large green oblong spikes, becoming at length a dull red.

3. A. RETROFLEXUS, L. *Hairy Amaranth.*

Rough-hairy; *stem* upright, stout, often zigzag, the lower branches recurved at the base; *leaves* ovate, wavy-margined; *spikes* compact, triply-compound, erect; *bracts* awl-shaped, pointed, much longer than the flowers.

Waste and cultivated grounds, among rubbish, common. July—Oct. *Plant* 2 to 3 feet high, scarcely distinct from A. hybridus, being rougher and stouter, with thicker and more crowded spikes and larger flowers.

4. A. SPINOSUS, L. *Spiny Amaranth.*

Smoothish, branching; *leaves* ovate-lanceolate, spiny at the axils; *sterile clusters* crowded in compound panicled and naked spikes, the fertile mostly compact and globular in the axils; *bracts* not longer than the calyx.

Roadsides and cultivated grounds; introduced. June—Sept. *Stem* 1 to 3 feet high, often purplish. *Spines* ¼ to ½ inch long. *Flowers* greenish.

5. A. BLITUM, L. *Low Amaranth.*

Smooth, diffusely spreading; *leaves* ovate or rhomboid, very obtuse or notched; *flowers* in small and round axillary clusters and in naked terminal spikes; *bracts* shorter than the calyx.

Gardens and waste grounds; introduced. July—Sept. *Stem* mostly prostrate and spreading. *Leaves* as long as the petioles, ½ to ⅔ as wide. *Flowers* numerous, greenish. *Stamens* 3.

* * * *Flowers red or purplish.*

6. A. HYPOCHONDRIACUS, L. *Prince's Feather.*

Nearly smooth; *stem* upright, stout; *leaves* ovate, acute; *flowers* clustered on upright compound spikes or racemes.

Common around gardens. July—Sept. Whole plant dark red, 3 to 4 feet high. *Leaves* green with a red purple spot or tinged with purple. *Flowers* bright red-purple as well as the subulate bracts.

7. A. MELANCHOLICUS, L. *Love-lies-bleeding.*

Leaves ovate-lanceolate, colored; *racemes* axillary, peduncled, roundish. A beautiful plant from India, 1 to 2 feet high. *Flowers* reddish-purple.

CULTIVATED EXOTICS.

2. GOMPHRENA, Linn. GLOBE AMARANTH.

BRACTS 5, colored, the 3 outer ones connivent, carinate. SEPALS 5, villous. DISK (nectary) cylindric, 5-toothed. UTRICLE circumscissile, 1-seeded.—*Annual or perennial herbs, with opposite leaves, and globose heads of flowers.*

1. A. GLOBOSA, L. *Annual Globe Amaranth.*

Stem erect, hairy; *leaves* oblong, pubescent ; *flowers* in globose solitary heads, keels of the bracts winged. A showy flower from India, much admired for its heads of flowers, which retain their beauty for a long time. *Stem* 12 to 18 inches high, with opposite axillary branches. *Flowers* purple.

2. A. PERENNIS, L. *Perennial Globe Amaranth.*

Leaves lanceolate; *heads* 2-leaved; *flowers* with a peculiar calyx. Native of South America. *Stem* about 3 feet high. *Flowers* in globose heads, purple, resembling heads of clover. July—Oct.

3. CELOSIA, Linn. COCK'S-COMB.

Gr. *keleos*, burnt; some of the species appear as if singed.

SEPALS 3 to 5, colored ; STAMENS united at base by a plaited disk. STYLE 2 to 3-cleft. UTRICLE circumscissile.—*Ornamental exotic herbs, with mostly alternate leaves.*

C. CRISTATA, L. *Crested Cock's-comb.*

Leaves ovate, acuminate; *stipules* falcate; *common peduncle* striated; *spike* oblong, compressed. Native of Japan, where the flowers or crests are a foot in diameter, and of an intense purplish-red. *Stem* 2 feet high. June—Sept.

ORDER 88. **NYCTAGINACEÆ.**

Herbs or shrubs, with opposite leaves, one of each pair smaller than the other, and a colored perianth resembling a corolla, with a plaited limb, falling off from the lower part which becomes indurated in fruit. STAMENS hypogynous, definite! ANTHERS 2-celled. OVARY free, with a single, erect ovule. STYLE 1: STIGMA 1. FRUIT a thin utricle, enclosed within the enlarged inflated bract.

MIRABILIS, Linn. FOUR-O'CLOCK.

PERIANTH funnel-form, *tube* contracted, free from the ovary, *limb* plaited, entire, deciduous. STAMENS 5. STIGMA globose.—*A beautiful genus of flowering plants, natives of warm latitudes, with white red yellow and variagated flowers.*

1. M. Jalapa, L. *Marvel of Peru.*

Leaves smooth, cordate, acuminate; *flowers* in clusters, stalked, large. This well known plant is a native of the West Indies. *Stem* 2 feet high. *Flowers* large in axillary and terminal clusters, with a wide spreading border, opening at 4 o'clock, P. M., bright purple. By cultivation it sports into many varieties with yellow and white, red and white, and red and yellow flowers. June—Sept.

2. M. longiflora, L. *Long flowered Four-o'clock.*

Leaves pubescent; *flowers* crowded; *tube* of the perianth very long, hairy. Native of Mexico. Per. June—Sept. *Stem* 2 feet high. *Flowers* white.

Order 89. **PHYTOLACCACEÆ.**—*Pokeweed Family.*

Plants with alternate entire leaves, and perfect flowers, with nearly the character of Chenopodiaceæ, but usually a several-celled ovary composed of as many carpels united into a ring and forming a berry in fruit; represented in the Northern States only by the typical genus.

PHYTOLACCA, Tourn. Pokeweed.

Gr. *phuton*, plant, and the French *lac*, lake, in allusion to the coloring matter which the berries yield.

Calyx of 5 rounded and petal-like sepals. Stamens 5 to 30. Ovary of 5 to 12 carpels, united into a ring, with as many short seperate styles; in fruit forming a depressed-globose 5 to 12-celled berry, with a single vertical seed in each cell.—*Tall and stout perennial herbs, with large petioled leaves, and flowers in racemes becoming lateral and opposite by the axillary prolongation of the stem.*

P. decandra, L. *Common Poke or Scoke. Garget.*

Leaves ovate, acute at both ends; *stamens* 10; *styles* 10.

Roadsides and moist grounds, common. July—Sept. *Root* very large, poisonous. *Stem* 5 to 8 feet high, round, smooth, branching, and when mature of a fine deep crimson or purple. *Leaves* 5 inches long, by 2 to 3 wide, smooth, entire and petioled. *Flowers* greenish-white. *Fruit* a dark purple berry, filled with a crimson juice.

Order 90. **POLYGONACEÆ.**—*Buckwheat Family.*

Herbs, with alternate usually entire leaves furnished with stipules in the form of sheaths above the swollen joints of the stem and mostly perfect flowers, with a more or less persistent calyx, a 1-celled ovary bearing 2 to 3 styles or stigmas, and a single erect orthotropous seed. Stamens 4 to 12, inserted on the base of the 3 to 6 cleft calyx.

1. POLYGONUM, Linn. Knotweed.

Gr. *polu*, many, and *gonu*, knee, from the numerous joints.

Calyx mostly 5-parted, the divisions often petal-like, persistent. Stamens 4 to 9. Styles or stigmas 2 to 3, short.

filiform. ACHENIA triangular or lenticular, usually covered by the persistent calyx.—*Herbaceous plants with jointed stems, and small flowers in axillary and terminal fascicles and spikes, or paniculate racemes.*

* PERSICARIA, Tourn. *Flowers in terminal or axillary spikes, white or rose colored. Mostly annuals.*

1. P. PENNSYLVANICUM, L. *Pennsylvania Knot-Grass.*

Stem smooth, tumid at the joints; *leaves* lanceolate, petiolate; *stipules* smooth; *spikes* oblong, crowded; *stamens* 8; *styles* 2 or 1.

Margins of ponds and ditches. July—Oct. *Stem* 2 to 3 feet high. *Leaves* 3 to 5 inches long, ⅓ as wide, slightly scabrous. *Spikes* dense-flowered, large and somewhat nodding. *Flowers* rose-colored, pedicellate.

2. P. PERSICARIA, L. *Lady's Thumb. Spotted Knotweed.*

Stem smooth; *leaves* lanceolate, pointed, roughish; *sheaths* fringed; *spikes* ovoid-oblong or cylindrical, dense, erect, on smooth peduncles; *stamens* mostly 6; *styles* 2, united nearly half their length.

Waste and damp places, very common. July, Aug. *Stem* 12 to 18 inches high, often colored. *Leaves* 2 to 4 inches long, ¼ as wide, usually marked with a dark heart-shaped spot near the middle. *Flowers* greenish-purple, in spikes about 1 inch long.

3. P. LAPATHIFOLIUM, L. *Pale Knotweed.*

Stem smooth, geniculate; *leaves* ovate-lanceolate or oblong-lanceolate, acuminate, smoothish, sometimes hairy beneath; *upper sheaths* somewhat fringed; *spikes* cylindrical or oblong, erect or nodding; *stamens* mostly 6; *styles* 2, distinct and at length divergent.

Swamps and ditches, rare. Aug. *Stem* 2 to 4 feet high. *Leaves* 3 to 5 inches long, ¼ to ½ as wide, on petioles ¼ to ½ inch wide. *Flowers* small, white, or tinged with red, in numerous panicled spikes.

4. P. HYDROPIPER, L. *Water-pepper. Smart-weed.*

Smooth; *leaves* lanceolate, marked with pellucid dots, wavy-margined; *sheaths* inflated, fringed; *spikes* slender and interrupted, drooping; *calyx* dotted with glands; *stamens* 6 to 8; *styles* 2 to 3, united at base; *fruit* lenticular or 3-sided. (P. punctatum, Ell.)

Low grounds, very common. Aug., Sept. A well known intensely acrid plant, 12 to 20 inches high, with the stem and leaves sprinkled with glandular dots. *Leaves* 2 to 3 inches long, 1-5 as wide. *Flowers* green, tinged with purple and white.

5. P. HYDROPIPEROIDES, Michx. *Mild Water-Pepper.*

Stem smooth, upright or ascending, often rooting at the joints along the base; *leaves* lanceolate, roughish, slightly hairy or ciliate; *sheaths* fringed with long bristles; *spikes* slender, loosely flowered, weak; *stamens* 7 to 8; *styles* 3, united below; *fruit* 3-sided, smooth and shining.

Swamps and along streams. July, Aug. *Stem* 12 to 15 inches high. *Leaves* 2 to 4 inches long, 1-5 as wide, sessile. *Spikes* several crowded near the summit of the stem, composed of small fascicles of reddish flowers. (P. mite, Pers.)

6. P. AMPHIBIUM, L. *Water Persicaria.*

Leaves elliptical-lanceolate or oblong, pointed or nearly obtuse, narrowed or somewhat heart-shaped at the base; *spikes* very dense, ovoid or cylindrical; *stamens* 5; *styles* 2; *fruit* flattened, smoothish.

Marshes or ponds. July, Aug. A very variable species, embracing several distinct varieties. *Stem* smooth, furrowed, short-jointed, often very long and creeping, or floating and rooting. *Leaves* 5 to 7 inches long, 1 to 2 inches wide, often shining. *Stipules* large, sheathing, mostly torn. *Flowers* rose-red, in spikes 1 to 3 inches long.

7. P. VIRGINIANUM, L. *Virginian Persicaria.*

Nearly smooth; *stem* angled, upright; *leaves* ovate or the upper ovate-lanceolate; acuminate, rounded at the base, short-petioled, rough-ciliate; *sheaths* cylindrical, truncate, hairy and fringed; *flowers* loosely disposed in a long and slender naked spike; *stamens* 5; *styles* 2, unequal.

Thickets in rich soil, common. Aug. *Stem* 2 to 4 feet high. *Leaves* 3 to 6 inches long, ⅓ as wide, on petioles ¼ to ½ inch long, *Spike* 10 to 20 inches long, simple or with one or two branchlets. *Flowers* small, white.

8. P. ORIENTALE, L. *Prince's Feather.*

Tall, branching, somewhat hairy; *leaves* ovate, pointed, petioled; *upper sheaths* salver-form; *spikes* numerous, nodding; *stamens* 7; *styles* 2.

Escaped from cultivation, and naturalized about gardens and waste grounds. Aug., Sept. *Stem* 4 to 6 feet high, erect, paniculately branched. *Leaves* 8 to 12 inches long, ½ as wide. *Flowers* bright rose-colored, open, in numerous large plume-like terminal spikes.

* * AVICULARIA, Meisn. *Flowers greenish-white, axillary; stamens* 5 *to* 8; *stigmas* 3.

9. P. ARVICULARIA, L. *Knot-grass. Goose-grass.*

Prostrate or spreading; *leaves* sessile, lanceolate or oblong; *flowers* apparently sessile; *sheaths* much shorter than the lower leaves; *fruit* enclosed in the calyx.

Roadsides, door-yards and waste places, common. June—Nov. *Stems* slender, ¼ to 1½ foot long, smooth, branching, with short white torn stipules at the joints. *Leaves* ½ to 1 inch long, ¼ as wide. *Flowers* greenish-white. Var. *erectum*, Roth, (P. erectum, L.) has upright or ascending stems, larger oval or elliptical leaves and usually 5 stamens.

10. P. TENUE, Michx. *Slender Knot-grass.*

Stem low and slender, upright, sparingly branched, sharp-angled; *leaves* sessile, narrowly-linear, very acute; *sheaths* capillary-fringed; *flowers* nearly sessile, often solitary, greenish-white; *fruit* nearly smooth, shining.

Dry soil and rocky hills. July—Sept. *Plant* 6 to 12 inches high. *Leaves* 1 to 1½ inch long, ⅛ to ¼ as wide, sessile, 3-veined. *Flowers* greenish-white.

* * * HELXINE, L. *Calyx* 5-*parted, pale-rose-colored or white; stamens mostly* 8; *styles or capitate stigmas* 3; *leaves heart-shaped or arrow-shaped; annuals.*

11. P. ARIFOLIUM, L. *Halbert-leaved Tear-thumb.*

Stem groove-angled; *leaves* halbert-shaped, acuminate, long-petioled; *flowers* somewhat racemed, few; *peduncles* glandular-bristly; *calyx* often 4-parted, closed; *stamens* 6; *styles* 2, very short.

Low grounds. Aug. *Stem* flaccid, somewhat climbing, by the reflexed prickles which beset its angles as well as the petioles. *Leaves* 2 to 5 inches long and ½ as wide, the divergent lobes at the base pointed. *Clusters* racemose, slender, loose, few-flowered at the ends of the branches. *Flowers* pale rose-colored.

12. P. SAGITTATUM, L. *Scratch-grass.*

Stem 4-angled; *leaves* arrow-shaped, short-petioled; *flowers* capitate; *peduncles* smooth; *stamens* 8; *styles* 3, slender; *fruit* sharply 3-angled.

Low grounds, common. July—Sept. A climbing plant often several feet in length, smooth except the angles of the stem and midrib beneath, which are closely beset with a line of sharp prickles pointing downwards. *Leaves* acute, 1 to 3 inches long, ½ as wide, on petioles ¼ to ¾ inch long, with smooth stipules. *Flowers* whitish in small terminal heads.

13. P. CONVOLVULUS, L. *Black Bindweed.*

Stems twining or procumbent, roughish; *leaves* cordate-hastate, pointed; *flowers* in small interrupted racemes; *calyx segments* obtusely keeled; *stamens* 8; *styles* 3; *fruit* smoothish.

Cultivated and waste grounds, common. July—Sept. A climbing plant 2 to 6 feet long, with roughish angled stems. *Leaves* 1 to 2 inches long, ½ as wide, with somewhat spreading lobes at base. *Flowers* whitish.

14. P. CILINODE, Michx. *Fringe-jointed False Buckwheat.*

Minutely downy; *sheath* fringed at base with reflexed bristles; *leaves* cordate and slightly hastate, acuminate; *racemes* panicled; *stamens* 8; *styles* 3.

Open woods and rocky hills, common. July—Sept. *Stems* climbing 3 to 9 feet. *Flowers* whitish.

15. P. DUMETORUM, L. *Climbing False Buckwheat.*

Smooth; *sheaths* naked; *leaves* heart-shaped or slightly hastate, pointed; *racemes* interrupted, leafy; 3 outer calyx-lobes strongly keeled, and in fruit winged; *fruit* smooth and shining; *stamens* 8; *styles* 3.

Moist thickets, common. Aug. *Stem* twining 8 to 12 feet over bushes. *Leaves* with distinct round lobes. *Flowers* in long interrupted racemes, white.

**** FAGOPYRUM, Tourn. *Calyx petal-like, equally 5-parted*; *stamens* 8; *styles* 3; *achenium 3-sided.—Annuals, with triangular-cordate or hastate leaves, and corymbose racemes or panicles of white flowers, often tinged with green or rose-color.*

16. P. FAGOPYRUM, L. *Buckwheat.*

Smoothish; *leaves* cordate-sagittate; *raceme* panicled; *flowers* 8, honey-bearing glands interposed between the stamens; *fruit* twice as long as the calyx, with acute and entire angles. (Fagopyrum esculentum, Tourn.)

Old fields, escaped from cultivation. June—Sept. A valuable grain, much cultivated on poor land. *Stems* 2 to 4 feet high. *Leaves* 2 to 4 inches long, ½ as wide. *Flowers* numerous, white, fragrant.

2. RUMEX, Linn. DOCK. SORREL.

The ancient Latin name of unknown etymology.

CALYX of 6 sepals, persistent, the 3 outer herbaceous, the 3 inner large, somewhat colored, valvately convergent over the 3-angled achenium. STAMENS 6. STYLES 3; STIGMAS tufted.—*Coarse herbs, with small mostly greenish flowers, commonly whorled in panicled racemes.*

* LAPATHUM, Tourn. *Flowers perfect, or sometimes polygamous; styles free; inner sepals bearing grain-like tubercles; bitter herbs, with the petioles sheathing at the base.*

1. R. VERTICILLATUS, L. *Swamp Dock.*

Leaves lanceolate, acute, flat; *racemes* nearly leafless, elongated, the flowers in crowded whorls; *sheaths* cylindrical; *valves* broad-cordate, entire, each bearing a very large grain.

Wet swamps and ditches, rather common. June, July. *Stem* 2 to 4 feet high, branched above. *Leaves* long, pale-green, thickish, with conspicuous sheaths. *Whorls* few-flowered. *Pedicels* ½ to 1 inch long,

2. R. OBTUSIFOLIUS, L. *Broad-leaved Dock.*

Stem roughish; *lowest leaves* ovate-cordate, obtuse, rather downy on the veins un-

underneath, slightly wavy-margined, the *upper* oblong-lanceolate, acute; *whorls* loose and distant; *valves* toothed, one of them bearing grains.

Fields and waste places, common; introduced. July. *Stem* 2 to 3 feet high, furrowed, branching, leafy. *Root leaves* about 1 foot long, 5 to 6 inches wide. *Flowers* in long, nearly naked racemes.

3. R. CRISPUS, L. *Curled Dock. Yellow Dock.*

Smooth; *leaves* lanceolate, with strongly wavy-curled margins, acute, the *lower* truncate or somewhat heart-shaped at the base; *whorls* crowded in long slender racemes, leafless above; *valves* entire, ovate, one of them bearing grains.

Cultivated and waste grounds, very common; introduced. June, July. *Stem* 3 to 4 feet high, from a deep spindle-shaped yellow root. *Flowers* numerous, in a large panicle, consisting of numerous racemes of half-whorls. The root is used medicinally.

4. R. SANGUINEUS, L. *Bloody-veined Dock.*

Leaves lanceolate, wavy-margined, the lowest cordate at the base; *whorls* distant, in long and slender leafless interrupted spikes; *valves* entire, one of them at least bearing grains.

Waste and cultivated grounds: sparingly introduced. June. *Stem* 2 to 3 feet high, reddish, branching, leafy. *Veins* of the leaves red, or in the variety *viridis*, green.

** ACETOSELLA, Tourn. *Flowers diœcious; styles adherent to the angles of the ovary; herbage acid.*

5. R. ACETOSELLA, L. *Field Sorrel. Sheep Sorrel.*

Low; *leaves* lance-halbert-form, the narrow lobes entire; *whorls* leafless, in slender panicled racemes; *valves* ovate, without grains.

A very common weed in sterile soil and worn fields. May. *Stem* 6 to 12 inches high, leafy. *Leaves* very acid, but pleasant tasted. *Flowers* small, red or reddish.

3. RHEUM, Linn. RHUBARB.

Rha, the river Volga, on whose banks the plants are said to be native.

CALYX colored, 6-sepaled, persistent. STAMENS 9. STYLES 3; STIGMAS multifid, reflexed. ACHENIA 3-angled, the angles margined.—*Perennials, with fasciculate flowers in racemose panicles.*

R. RHAPONTICUM, L. *Garden Rhubarb. Pie-plant.*

Leaves smooth, cordate-ovate, obtuse; *petioles* channeled above, rounded at the edges. May. Native of Asia, cultivated in gardens for the juicy acid petioles. *Stem* stout and fleshy. 3 to 4 feet high, hollow with large sheathing stipules at the joints. *Leaves* 1 to 2 feet long, ⅔ as wide, on petioles 6 to 18 inches long. *Flowers* greenish-white in a terminal panicle, at first enclosed in a white membraneous bract.

ORDER 91. LAURACEÆ.—*Bay Family.*

Aromatic trees or shrubs, with alternate simple leaves mostly marked with minute pellucid dots, and clustered flowers with a regular calyx of 4 to 6 colored sepals which are barely united at the base, imbricated in 2 series in the bud, free from the ovary. STAMENS definite. STYLE single. FRUIT a 1-seeded berry or drupe.

1. SASSAFRAS, Nees. SASSAFRAS.

FLOWERS diœcious, with a 6-parted spreading calyx. STAMENS 9, inserted on the base of the calyx in 3 rows, the 3 inner with a pair of stalked glands at the base of each: ANTHERS 4-celled, 4-valved. FERTILE FLOWERS with 6 short rudiments of stamens and an ovoid ovary. DRUPE ovoid, supported on a club-shaped fleshy pedicel.—*Trees with spicy aromatic bark, deciduous leaves, and greenish-yellow flowers in clustered and peduncled corymbed-racemes, appearing with the leaves.*

S. OFFICINALE, Nees. *Common Sassafras.*

Leaves ovate, entire or some of them 3-lobed and cuneate at base; *racemes* with linear bracts. (Laurus Sassafras, L.)

Rich woods and hillsides, common. April. May A tree 15 to 40 feet high. with yellowish-green twigs. *Flowers* greenish-yellow, in clustered racemes at the end of the last years twigs. *Fruit* a dark blue drupe, born on a red stalk.

2. BENZOIN, Nees. SPICE-BUSH.

FLOWERS polygamous-diœcious, with a 6-parted open calyx. The STERILE FLOWERS with 9 stamens in 3 rows, the inner 1 to 2-lobed and gland-bearing at the base; ANTHERS 2-celled, 2-valved. FERTILE FLOWERS with 15 to 18 rudiments of stamens in 2 forms, and a globular ovary. DRUPE obovoid, the stalk not thickened.—*Shrub with entire deciduous leaves, and yellow flowers preceding the leaves in nearly sessile umbel-like clusters.*

B. ODORIFORUM, Nees. *Spice-wood. Fever-bush.*

Nearly smooth; *leaves* oblong-obovate, pale underneath; *pedicels* scarcely as long as the flowers. (Laurus Benzoin, L.)

Damp woods. April, May. A shrub 6 to 10 feet high, pervaded with an aromatic flavor similar to gum Benzoin. *Leaves* 2 to 4 inches long, and about ½ as wide. *Flowers* in clustered umbels, greenish, appearing before the leaves. *Berries* ripe in Sept.

ORDER 92. **THYMELEACEÆ.**—*Mezereum Family.*

Shrubs, with acrid and very tough bark, entire leaves, and perfect flowers with a regular and petal-like calyx, bearing usually twice as many stamens as its lobes, inserted into the calyx. OVARY solitary, with 1 ovule. STYLE 1: STIGMA undivided. FRUIT hard, dry, drupaceous.

1. DIRCA, Linn. LEATHERWOOD.

Gr. *Dirke*, the name of a fountain near Thebes.

PERIANTH colored, tubular-funnel-shaped, truncate, the border wavy or obscurely 4-toothed. STAMENS 8, long and slender, inserted on the perianth above the middle, exserted, the alternate ones longer. Style 1, filiform: stigma capitate. Drupe oval.—*A much branched shrub, with jointed branches, oval obovate alternate leaves, and light yellow flowers, preceeding the leaves.*

D. palustris, L. *Moosewood. Wicopy.*

Leaves oval-obovate, alternate, at length smooth, on very short petioles, entire, obtuse.

Damp rich woods, not common. April. *Shrub* 2 to 5 feet high, with white soft and very brittle wood, but the fibrous bark is remarkably tough, whence the common name *Leatherwood*. *Flowers* preceeding the leaves, 3 in a cluster on a short thick peduncle. *Berry* oval, reddish when ripe.

2. DAPHNE, Linn. Mezereum.

From the nymph *Daphne*, who, it is said was changed into a laurel.

Perianth 2-cleft, marescent; *limb* spreading. Stamens 8, included in the tube of the perianth. Style 1. Drupe 1-seeded.—*Mostly evergreen shrubs, with the leaves generally from the terminal buds and the flowers from the lateral.*

D. Mezereum, L. *Common Mezereum.*

Leaves deciduous, lanceolate, in terminal tufts, entire, sessile, about 3 from each lateral bud; *perianth* funnel-form, the *segments* ovate, spreading; *stamens* inserted in 2 rows near the top of the tube; *filaments* very short; *stigma* sessile. A beautiful European shrub, 1 to 3 feet high, flowering in March. *Flowers* pink and white, clothing nearly the whole plant.

Order 93. NYSSACEÆ.—*Tupelo Family.*

Trees, with diœcious-polygamous flowers, consisting only of the genus *Nyssa*, which has commonly been appended to Santalaceæ from which it differs in *the solitary ovule* of the ordinary structure, *suspended from the top of the cell.*

NYSSA, Linn. Tupelo.

Sterile flowers with a 5-parted calyx, and about 10 stamens on the outside of a convex disk. Fertile with the tube of the calyx adherent to the 1-celled ovary, the border 4-parted and deciduous. Stamens 5: style elongated, revolute. Fruit an oval or oblong berry-like drupe, with a grooved endocarp.—*Trees, with alternate deciduous smooth and shining leaves, and axillary peduncles, bearing sterile flowers in capitate clusters or racemes, and the fertile 2 to 4 together or sometimes solitary.*

N. MULTIFLORA, Wang. *Pepperidge. Sour Gum.*

Leaves oval and obovate, acute or pointed at both ends, entire, the petioles and midrib hairy; *fertile flowers* mostly in 3s; *drupe* oval.

Woods, in dry or moist soil, common. May. A middle-sized tree, with dark grey bark, horizontal branches, deep green and shining leaves, and small greenish flowers. The wood is very unwedgeable, on account of the oblique direction and crossing of the fibre of different layers.

ORDER 94. SANTALACEÆ.—*Sandalwood Family.*

Herbs, shrubs, or trees, with entire leaves, the 4 to 5-cleft perianth valvate in the bud, its tube coherent with the 1-celled ovary, which contains 1 to 4 ovules. STAMENS 4 or 5, opposite the segments of the perianth and inserted into their bases. STYLE 1: STIGMA often lobed. FRUIT a nut or drupe.

1. COMANDRA, Nutt. BASTARD TOAD-FLAX.

Gr. *koma*, hair, and *andres*, for stamens, in allusion to the hairy tufts attached to the anthers.

FLOWERS perfect. PERIANTH bell-shaped or urn-shaped, the limb 5-cleft, persistent. STAMENS 5, rarely 4, the *anthers* adhering to the lobes of the perianth by a tuft of thread. STYLE single. FRUIT dry and rather nut-like, 1-seeded, crowned by the persistent perianth.—*Low and smooth perennial herbs, with alternate oblong and sessile leaves, and greenish-white flowers in terminal or axillary umbel-like cymes.*

C. UMBELLATA, Nutt. *Bastard Toad-flax.*

Stem round and erect; *leaves* obovate-oblong, subsessile, entire; *cymes* corymbose-clustered, several-flowered; *perianth-tube* continued beyond the ovary, forming a neck to the globular-urn-shaped fruit; *style* slender, as long as the stamens.

Dry or rocky banks, common. May, June. *Stems* branching, 8 to 12 inches high, smoothish. *Flowers* whitish, numerous on short pedicels.

2. PYRULARIA, Michx. OIL NUT.

Name a diminutive of *Pyrus*, from the fruit, which resembles a small pear.

FLOWERS diœcious. PERIANTH 5-cleft, the lobes recurved. STERILE FLOWERS with 5 stamens on very short filaments, alternate with 5 rounded glands. FERTILE FLOWERS with a pear-shaped ovary invested by the adherent perianth; DISK with 5 glands: STYLE 1, short and thick: STIGMA capitate. FRUIT fleshy and drupe-like.—*A low straggling shrub, with alternate short-petioled and veiny leaves, and small greenish sessile flowers in simple terminal spikes.*

P. OLEIFERA, Gray. *Buffalo-nut. Oil-nut.*

Leaves ovate-oblong, pointed at both ends, somewhat downy, or at length nearly smooth, somewhat succulent.

Rich wooded banks and mountains. May. *Stem* 4 to 6 feet high, with a very deep root. *Leaves* 2 to 3 inches long, oily to the taste. *Flowers* in a terminal spike greenish-yellow. *Spikes* ripening but one fruit, which is about 1 inch long.

ORDER 95. LORANTHACEÆ.—*Misletoe Family.*

Shrubby plants with coriaceous greenish foliage, parasitic on trees, represented in the northern temperate zone chiefly by the Mistletoe, distinguished from the preceding order by the truly simple *ovule* being *solitary and suspended from the apex of the cell.* FRUIT a 1-seeded berry.

VISCUM; Linn. MISLETOE.

The ancient Latin name, from *viscus*, glue, in allusion to the glutinous fruit.

FLOWERS monœcious or diœcious. PERIANTH fleshy-coriacious; in the sterile flowers 3 to 4-parted, the triangular lobes, each with a sessile anther directly adhering to its inner face, and opening by several pores; in the fertile the tube of the perianth is combined with the ovary, the border obsolete. STIGMA sessile. FRUIT a globular berry.—*Much branched parisitical shrubs, with jointed stems, opposite leaves and small flowers in short spikes.*

V. FLAVESCENS, Pursh. *White Misletoe.*

Branches round, spreading; *leaves* obovate or oval, contracted at the base into a short petiole, 3-nerved; *spikes* axillary, solitary.; *sterile flowers* mostly trifid.

Parasitic on the trunks of old trees, especially Elms, Oaks, and Hickories. April. Whole plant yellowish-green, 9 to 18 inches high. *Flowers* small, greenish-yellow. *Berries* pearly-white, resembling white wax.

ORDER 96. ULMACEÆ.—*Elm Family.*

Trees or shrubs, with alternate roughish leaves, and deciduous stipules, perfect or rarely polygamous flowers in axillary clusters or solitary, with the definite stamens inserted on the base of the free perianth which is imbricated in the bud. PERIANTH free from the ovary, bell-shaped, 4 to 9-cleft. STYLES OR STIGMAS 2; OVARY 1 to 2-celled. FRUIT 1-celled, with a single suspended seed.

1. ULMUS, Linn. ELM.

The classical Latin name.

PERIANTH bell-shaped, 4 to 9-cleft. STAMENS 4 to 9, with long and slender filaments. STYLES 2, short. OVARY flat, 2-celled, with a single anatropous ovule suspended from the summit of each cell. FRUIT a 1-celled and 1-seeded membranaceous samara winged all around.—*Trees, rarely shrubs, with rough leaves, and (often polygamous) purplish or yellowish flowers in lateral clusters, preceding the short-petioled leaves.*

1. U. AMERICANA, L. *American or White Elm.*

Leaves smooth above, downy underneath, oblong-ovate, pointed, sharply doubly serrate; *flowers* in umbel-like clusters, on conspicuous pedicels; *fruit* oval, with woolly-fringed margins.

Moist woods and river banks, common. April. A large tree, 20 to 70 feet high, with long spreading pendulous branches, and slender pendulous branchlets. *Leaves* 4 to 5 inches long, doubly denticulate. *Flowers* small, purplish. *Stamens* about 8.

2. U. FULVA, Michx. *Slippery Elm. Red Elm.*

Leaves very rough on the upper side, roughish downy underneath, ovate oblong doubly serrate; *buds* rusty-woolly; *flowers* nearly sessile in dense clusters; *fruit* nearly orbicular, the margins naked.

Woods, in rich, dry or moist soil, common. April. A middle-sized or small tree, 20 to 40 feet high, and 9 to 20 inches in diameter, with straggling branches and rather tough reddish wood, remarkable for the tough mucilaginous inner bark. *Stamens* about 7, short, reddish.

2. CELTIS, Tourn. NETTLE-TREE.

An ancient Greek name for the Lotus, which this tree is said to resemble.

FLOWERS polygamous. PERIANTH 5 to 6-parted, persistent. STAMENS 5 to 6. OVARY 1-celled, with a single suspended ovule: STIGMAS 2, long and pointed, recurved. FRUIT a globular drupe, with thin flesh.—*Trees or large shrubs, with pointed, petioled leaves, and greenish axillary flowers, solitary or in pairs, appearing with the leaves.*

1. C. OCCIDENTALIS, L. *Sugar-berry. Hack-berry.*

Leaves roughish, obliquely-ovate, sharply serrate, finely acuminate, unequal and often heart shaped at the base; *flowers* small, subsolitary.

Woods and river banks. May. A tree 20 to 60 feet high, with the aspect of an Elm. *Leaves* 2 to 5 inches long, with a very long acumination and very unequal at the base. *Flowers* small, greenish-white. *Fruit* dull-purple or yellowish-brown, sweet and edible.

2. C. CRASSIFOLIA, Lam. *Hackberry.*

Leaves lance-ovate, acuminate, serrate, unequally heart-shaped at base, rough and hairy on both sides; *peduncles* mostly 2-flowered.

Low grounds. May. A small tree, 20 to 40 feet high, with a straight slender trunk, undivided to a considerable height, covered with an unbroken bark. *Leaves* 3 to 6 inches long, thick and firm. *Flowers* small, white, succeeded by a round, black drupe about the size of the Whortleberry.

3. C. PUMILA, Pursh. *Dwarf Hackberry.*

Leaves broadly ovate, acuminate, equally serrate, unequal at the base, smooth on both sides, the younger only pubescent; *peduncles* mostly 3-flowered; *fruit* solitary.

River banks, along the Susquehanna. A dwarf very straggling shrub, 3 to 10 feet high. *Leaves* sometimes heart-shaped, nearly as broad as long, with a very short acumination. *Berries* brown or nearly black.

ORDER 97. SAURURACEÆ.—*Lizard's-tail Family.*

Herbs, with jointed stems, alternate entire leaves with stipules, and perfect flowers in spikes, entirely destitute of a perianth, and 3 to 5 more or less united ovaries.—OVULES few, orthotropous. FRUIT a capsule or berry, 3 to 5-celled, few-seeded.

SAURURUS, Linn. LIZARD'S-TAIL.

Gr. *saura*, a lizard, and *oura*, a tail; in allusion to the form of the inflorescence.

Inflorescence an ament or spike of 1-flowered scales. STAMENS mostly 6 or 7, hypogynous, with long and distinct filaments. FRUIT somewhat fleshy, wrinkled, of 3 or 4 pistils united at the base, with recurved stigmas. SEEDS usually solitary, ascending.—*A perennial aquatic herb, with heart-shaped petioled leaves, and white flowers, each from the axil of a small bract, closely aggregated in a slender terminal spike.*

S. CERNUUS, L. *Lizard's-tail.*

Stem angular; *leaves* cordate, acuminate.

Margins of ponds and streams, common. June—Aug. *Stem* 1 to 2½ feet high, weak, furrowed. *Leaves* 4 to 6 inches long, ½ as wide, smooth and glauceous, on petioles 1 to 2 inches long. *Spike* slender, 3 to 6 inches long, drooping at the end.

ORDER 98. CERATOPHYLLACEÆ.—*Hornwort Family.*

Aquatic herbs, with whorled finely dissected leaves, and minute axillary and sessile monœcious flowers without any floral envelopes, but with a many-cleft involucre.—STAMENS 16 to 24. FERTILE OVARY free, 1-celled with a suspended ovule; STYLE filiform, oblique, sessile. FRUIT an achenium beaked with the indurated stigma. SEED containing 4 cotyledons.

CERATOPHYLLUM, Linn. HORNWORT.

Gr. *keras*, a horn, *phullon*, a leaf, alluding to the horn-like divisions of the leaves.

STERILE FLOWERS of 12 to 24 stamens with large sessile anthers. FRUIT an achenium, beaked with the slender persistent style.—*Herbs, growing under water, in ponds or slow flowing streams; the sessile leaves cut into 2 or 3 forking filiform rather rigid divisions.*

C. ECHINATUM, A. Gray. *Hornwort.*

Achenium elliptical, rough-pointed on the sides, with a terminal and 2 short lateral spines, the slightly winged margins armed with blunt teeth, which finally elongate and equal the lateral spines; divisions of the leaves minutely serrulate, mostly 2-toothed at the apex.

Common. June, July. *Flowers* minute.

ORDER 99. CALLITRICHACEÆ.—*Starwort Family.*

Aquatic small annuals, with opposite entire leaves, and polygamous solitary flowers *in their axils, usually between a pair of bracts, without proper floral envelopes.*—FRUIT 4-celled, 4-lobed and 4-seeded, consisting only of the genus

CALLITRICHE, Linn. WATER-STARWORT.

Gr. *kalos*, beautiful, *thrix*, *trichos*, hair; alluding to the slender stems.

STAMENS 1, rarely 2: FILAMENTS slender: ANTHERS 1-celled, kidney-form. STYLES 2, awl-shaped, distinct. FRUIT indehiscent, nut-like, 4-lobed and 4-celled, but the styles only 2, awl-shaped, distinct. SEED solitary and suspended, filling each cell, anatropous.—*Aquatic small annuals, with opposite entire leaves.*

1. C. VERNA, L. *Vernal Water-starwort.* *

Leaves 3-nerved, the floating ones spatulate or obovate, the immersed linear; *bracts* incurved; *styles* constantly erect; *fruit* nearly sessile; the *lobes* parallel in pairs and bluntly keeled on the back.

Shallow pools and slow streams, common. May—Sept. *Stem* floating 1 to 2 feet long, composed of 2 tubes, simple or branched. *Leaves* 2 at each joint, becoming crowded above into a star-like tuft upon the surface of the water. *Flowers* white, axillary 1 to 2 together.

2. C. PLATYCARPA, Kutzing.

Fruit nearly sessile; the *lobes* parallel in pairs, slightly winged on the back; *styles* erect in the flowers, reflexed closely over the fruit. Bracts and foliage much as in the last, the fruit twice as large: growing in similar situations.

ORDER 100. **PODOSTEMACEÆ.**—*River-weed Family.*

Aquatics, growing on stones in running water, resembling Sea-weeds *or* Mosses, *with the minute naked flowers bursting from a spathe as in* Liverworts, *producing a 3-celled many-seeded capsule;* represented in North America by the genus

PODOSTEMUM, Michx. RIVER-WEED.

Gr. *pous*, a foot, and *stemon*, stamen: the stamen appearing as if on a common foot-stalk.

PERIANTH OR BRACTS, of 2 to 3 small awl-shaped scales. STAMENS 2, rarely 3; FILAMENTS monodelphous below. STYLES OR STIGMAS 2, awl-shaped. CAPSULE 2-celled, 2-valved, many-ribbed. SEEDS minute, very numerous on a thick central placentæ.—*Flowers axillary and solitary, pedicelled from a tubular spathe.*

P. CERATOPHYLLUM, Michx. *Thread-foot.*

Leaves rigid, dichotomously dissected; *filaments* united to above the middle.

Common in the bottom of shallow streams. July. A small olive-green plant resembling a Sea-weed, and tenaciously adhering to loose stones at the bottom, similar to a *Fucus* by fleshy disks or processes in the place of roots. *Leaves* numerous, alternate, divided into several long linear-bristly segments, 1 to 4 inches long. *Flowers* on short thick peduncles.

ORDER 101. **EUPHORBIACEÆ.**—*Spurge Family.*

Trees, shrubs or herbs, often abounding in an acrid milky juice, opposite or alternate, simple, rarely compound leaves, often furnished with stipules, usually terminal or axillary monœcious or diœcious flowers, and a capsule of 2 to 3 or several 1-seeded ovaries united around a central axis, separating when ripe.—CALYX usually valvate in the bud, occasionally wanting. PETALS sometimes present. STIGMAS 2 to 3 or more, often forked.

1. EUPHORBIA, Linn. SPURGE.

Named after *Euphorbus*, physician to King Juba.

FLOWERS monœcious, included in a cup-shaped 4 to 5-lobed involucre resembling a calyx or corolla, usually with large and thick glands at its sinuses. STERILE FLOWERS numerous and lining the base of the involucre, each from the axils of a little bract, and consisting merely of a single stamen jointed on the pedicel like the filament. FERTILE FLOWERS solitary in the middle of the involucre, soon protruded on a long pedicel, consisting of a 3-lobed, 3-celled ovary without a calyx or a mere vestige. STYLES 3, 2-cleft, therefore 6 stigmas. CAPSULE 3-lobed, 3-celled; *cells* 1-seeded.—*Herbs or shrubs, with a milky juice, generally opposite leaves, the uppermost often in whorls or pairs, or sometimes wanting, and lateral or terminal peduncles often umbellate clustered.*

* *Stem leaves alternate; flowers in involucrate umbels.*

1. E. COROLLATA, L. *Flowering Spurge.*

Stems upright, nearly simple; *leaves* oblong, obtuse, entire, the *floral leaves* small: *umbel* divided into 5 or 6 rays, then 3 or 2 forked; *glands* oval, each at the base of a petaloid involucre.

Dry banks and sandy fields, very common. Per. July—Sept. *Stem* slender, 1 to 2 feet high, mostly smooth. *Leaves* 1 to 2 inches long, often quite linear, very entire, scattered on the stem, verticillate and opposite in the umbel. *Corolla-like involucre* large, white, showy.

2. E. DARLINGTONII, Gray. *Darlington's Spurge.*

Stem-leaves lance-oblong, pale and minutely downy underneath, the *secondary or floral leaves* orbicular dilated, all entire; *umbel* divided into 5 to 8 rays, then several times simply forked; *segments* of the floral *involucre* colored, entire, sub-reniform; *ovary* warty.

Moist woods, Chester County, &c. May, June. Per. *Stem* 2 to 4 feet high, smooth, rarely branched below the umbel. *Leaves* 3 to 4 inches long, the floral oval, very obtuse, the others rounded and nearly as broad as long. *Floral involucre* purplish-brown within. *Capsule* at length nearly smooth.

3. E, HELIASCOPIA. L. *Sun Spurge.*

Erect: *floral leaves* obovate; *stem leaves* wedge-form, all obovate and nearly rounded at the end, finely serrate; *umbel* divided into 5 rays, then into 3s, or at length simply forked; *glands* orbicular, stalked; *fruit* smooth and even.

Waste places, rare. July—Sept. Ann. *Stem* smooth, 8 to 16 inches high, branched from the root. *Leaves* scattered ½ to 1½ inch long, ⅔ as broad at the rounded or retuse apex. *Branches* of the *umbel* mostly short. *Sterile flowers* most numerous.

4. E. PEPLUS, L. *Petty Spurge.*

Stem erect or ascending, branched below; *leaves* entire, very obtuse, the *lower* oval or obovate, petioled, the *floral* round-heart-shaped; *umbel* divided into many rays, then forking; *glands* long-horned; *fruit* roughish and thickened on the back of each carpel, otherwise smooth.

Waste grounds, introduced. July, Aug. Ann. *Plant* 5 to 10 inches high, smooth. *Involucels* or *floral leaves* large, clasping, broader than long. *Flowers* conspicuous.

** *Stem leaves opposite. Heads axillary or fasciculate.*

5. E. HYPERICIFOLIA, L. *Common Spurge. Eyebright.*

Smoothish; *stem* branching, nearly erect; *leaves* ovate-oblong or oval-oblong, oblique or heart-shaped at the base, often curved, finely serrate, 3 to 5-ribbed underneath; *corymbs* terminal.

Waste and cultivated places, common. July—Sept. Ann *Stem* 10 to 20 inches high, usually purple, very smooth. *Leaves* ½ to 1 inch long, ¼ as wide, on very short petioles, marked with oblong dots and blotches, ciliate. *Corymbs* of small white hoods.

6. E. MACULATA, L. *Spotted Spurge. Milk Purslane.*

Hairy or sometimes smoothish, diffusely prostrate, very much branched from the root; *leaves* oval, minutely serrulate towards the end, unequal at the base, slightly 3-ribbed; *fruit* mostly hairy; *seeds* 4-angled.

Gravelly banks and open places, common everywhere. June—Sept. Annual. *Stem* 6 to 12 inches in length, spreading flat on the ground. *Leaves* opposite, ¼ to ½ inch long, and ½ as wide, often purplish, or with a dark purple blotch on the upper side. *Heads* of flowers small, crowded near the summit.

7. E. IPECACUANHÆ, L. *Wild Ipecac. Ipecac Spurge.*

Procumbent or suberect, smooth; *leaves* opposite, varying from obovate or oblong to long and narrowly linear, entire; *peduncles* elongated, axillary, 1-flowered; *fruit* smooth.

Dry sandy soil, rare. May—July. Per. *Stems* many from a very long perpendicular root, low and diffusely spreading, flowering and simply forking from the base. *Leaves* 1½ to 2 inches long, ¼ to ½ inch wide.

8. E. DENTATA, Michx. *Toothed Spurge.*

Upright, hairy; *leaves* ovate or oblong-lanceolate, coarsely serrate with blunt teeth, narrowed into a slender petiole; *flowers* crowded at the summit of the stem

Shady hillsides, in rich soil. Aug. Ann. *Plant* about 1 foot high, at first simple afterwards with side branches. *Upper leaves* spotted. *Involucre lobes* cut fringed. *Fruit* smooth, short-stalked.

CULTIVATED EXOTICS.

9. E. LATHYRUS, L. *Caper Spurge. Mole-tree.*

Stem erect, stout, smooth; *leaves* linear-oblong, entire, the floral oblong-ovate and heart-shaped, pointed; *umbel* mostly 4-rayed, *rays* dichotomous; *glands* of the involucre short-horned; *fruit* and *seeds* smooth.

Cultivated grounds and gardens. July—Sept. *Stem* 2 to 3 feet high. *Leaves* 2 to 4 inches long, ¼ to ¾ wide, numerous and arranged in 4 rows on the stem. *Umbel* of 4 verticillate branches with a central subsessile head.

10. E. PUNICA, L. *Scarlet Spurge. Splendid Euphorbia.*

Stem shrubby, fleshy, armed with rigid sharp thorns; *leaves* ovate, tapering to the base, smooth, entire, acute, mucronate; *peduncles* axillary, 2 to 3 times dichotomous; *bracts* scarlet. A singular and showy garden plant.

2. PHYLLANTHUS, Linn.

Gr. *phullon*, leaf, *anthos*, blossom; the flowers being attached to the leaves.

FLOWERS monœcious. PERIANTH 5 to 6 parted, alike in the sterile and fertile flowers. STAMENS 3: FILAMENTS united in a column, surrounded by 5 to 6 glands or a 5 to 6-lobed glandular disk. OVARY 3-celled, the cells 2-ovuled: STYLES 3, 2-cleft: STIGMAS 6. CAPSULE separating into 3 carpels, which split into 2-valves.— *Herbs or shrubs, with alternate stipulate leaves, and minute axillary flowers.*

P. CAROLINENSIS, Walt. *Leaf-blossom.*

Stem erect, herbaceous, with alternate branches; *leaves* simple, entire, smooth, oval and obovate, short-petioled; *flowers* few, subsolitary.

Gravelly banks. July. Aug. Ann. *Stem* 6 to 10 inches high, slender. *Leaves of the stem* ½ to ¾ by ⅓ to ½ inch, those of the branches ½, and those of the branchlets ¼ as large. *Flowers* very small, whitish, 1 to 3 in each axil.

3. ACALYPHA, Linn. MERCURY.

The Greek name for the nettle, which this plant resembles.

FLOWERS monœcious. PERIANTH of the sterile flowers 4-parted, of the fertile 3-parted. STAMENS 8 to 16: FILAMENTS short, united at the base: ANTHER-CELLS separate, long, hanging from the apex of the filament. STYLES 3, cut-fringed. CAPSULE separating into 3 globose carpels which split into 2 valves.—*Mostly herbaceous plants, with alternate petioled stipulate leaves, and the clusters of sterile flowers with a minute bract, the fertile surrounded by a large leaf-like cut-lobed persistent bract.*

1. A. VIRGINICA, L. *Three-seeded Mercury.*

Leaves ovate or oblong-ovate, obtusely serrate, long petioled; *sterile spike* rather few-flowered; *involucre* of the fertile flowers heart-shaped, broad-ovate, acuminate, veined and toothed.

Fields and open places, common. Aug. Ann. A homely weed 1 to 2 feet high, smooth or hairy, often reddish in autumn. *Leaves* 3-veined, 1 to 2½ inches long, ½ as wide. *Pistillate flowers* at the base of the peduncle, of the staminate spike.

2. A. CAROLINIANA, Walt. *Carolinian three-seeded Mercury.*

Leaves on long petioles, rhombic-ovate, acuminate, serrate, entire at base; *bracts* heart-shaped, lobed; *fertile flowers* at the base of the staminate spike.

Fields, rare. July, Aug. Ann. *Stem* 9 to 18 inches high. A peculiar species.

4. RICINUS, Linn. PALMA CHRISTI.

Lat. *ricinus*, an insect, which the fruit of these plants resemble.

Monœcious. Sterile flowers. PERIANTH 5-parted. STAMENS numerous: FILAMENTS united branching. Fertile flowers. PERIANTH 3-parted. STYLES 3, 2-parted. CAPSULE mostly echinate, 3-celled, 3-seeded.—*Herbs and shrubs, with peltate, palmate leaves, and monœcious flowers.*

R. COMMUNIS, L. *Castor-oil Bean.*

Stem herbaceous, glaucous, *leaves* peltate-palmate, *lobes* lanceolate, serrate; *capsule* echinate. Aug., Sept. Native of the East Indies. In our gardens it is a tall, smooth plant, of a light bluish green color, but in its native country it becomes a tree. *Leaves* 4 to 12 inches in diameter, on long petioles. Cultivated extensively in various parts of the U. S. for the purpose of obtaining oil from the seed.

5. BUXUS, Linn. BOX-WOOD.

Monœcious. Sterile flowers. CALYX 3-leaved: PETALS 2. STAMENS 4, with the rudiment of an ovary. Fertile flowers. CALYX 4-sepaled. PETALS 3. STYLES 3. CAPSULE with 3 beaks and 3 cells: SEEDS 2.—*Evergreen shrubs, with opposite leaves, and inconspicuous flowers.*

B. SEMPERVIRENS, L. *Box.*

Leaves ovate; *petioles* hairy at the edge; *anthers* ovate, sagittate. Native of Europe. Var. *angustifolia* has narrow lanceolate leaves. Var. *suffruticosa* the dwarf box has obovate leaves and a scarcely woody stem, highly ornamental for edgings in gardens.

ORDER 102. JUGLANDACEÆ.—*Walnut Family.*

Trees, with alternate unequally pinnate leaves, without stipules, green inconspicuous monœcious flowers in aments with an irregular calyx, and a fruit which is a kind of dry drupe with a bony endocarp (nut-shell), containing a large 4-lobed orthotropous seed. FERTILE FLOWERS solitary or in small clusters, with a regular 3 to 5-lobed calyx adherent to the incompletely 2 to 4-celled but only 1-ovuled ovary.

1. JUGLANS, Linn. WALNUT.

Lat. *Jovis glans*; i. e. the nut of Jupiter.

STERILE FLOWERS in long and simple lateral aments; the CALYX SCALES unequally 3 to 6-parted, somewhat bracteate at base. STAMENS 8 to 40: FILAMENTS very short. FERTILE FLOWERS solitary or several together on a peduncle at the end of the branches: CALYX 4-toothed, bearing 4 small petals at the sinuses. STYLES 2, very short: STIGMAS 2, somewhat club-shaped and fringed. FRUIT drupaceous, with a fibrous-fleshy indehiscent epicarp, and a rough irregularly furrowed endocarp or nut-shell.—*Large trees, with strong scented aromatic bark, &c., odd-pinnate leaves of many serrate leaflets, and sterile flowers in aments, the fertile terminal.*

1. J. CINEREA, L. *Butternut. White Walnut.*

Leaflets numerous (15 to 17), oblong-lanceolate, pointed, rounded at the base, downy beneath; *petioles* and *branchlets* downy with clammy hairs; *fruit* oblong, acuminate, clammy, the *nut* deeply and irregularly furrowed.

River banks and rich woods, common. May; *fruit* ripe in Sept. *Tree* 30 to 50 feet high, with gray bark, and widely spreading branches. *Leaves* 12 to 20 inches long. *Barren flowers* in long aments: *fertile* in short spikes. The kernel is oily and pleasant-flavored. From the bark is extracted an excellent cathartic.

2. J. NIGRA, L. *Black Walnut.*

Leaflets numerous (15 to 21), ovate-lanceolate, acuminate, serrate, subcordate at base, smooth above, the lower surface and the *petioles* minutely downy; *fruit* globose, with scabrous punctures.

Rich woods, common. May; *fruit* ripe in Oct. A large handsome tree 60 to 90 feet high, with a diameter of 3 to 6 feet; *bark* brown. The wood is very valuable for cabinet work, purplish-brown, turning blackish with age.

2. CARYA, Nutt. HICKORY.

Gr. *Karua*, the Walnut.

STERILE FLOWERS in slender lateral catkins, which are mostly in threes on a common peduncle: CALYX naked, unequally 3-parted. STAMENS 3 to 8: FILAMENTS scarcely any. FERTILE FLOWERS 2 to 3 together at the ends of the branches, with a 4-toothed calyx, and no petals. STIGMA large, 4-lobed. FRUIT globular, with a somewhat leathery epicarp, which splits into 4 valves, and falls away when ripe from the smooth and slightly 4 to 6 angled nut-shell, which is incompletely 4-celled.—*Trees, with hard and very tough wood, odd-pinnate leaves of 5 to 9 leaflets, and sterile flowers in branched aments.*

* *Seed edible and delicious: bark exfoliating in shaggy strips or plates.*

1. C. ALBA, Nutt. *Shell-bark Hickory.*

Leaflets 5, minutely downy underneath, finely serrate, the 3 upper obovate-lanceolate, the lower much smaller and oblong-lanceolate, all acuminate; *fruit* depressed-globular; *nut* somewhat flattened.

Rich moist woods, common. April, May; *fruit* in Oct. A tall and handsome tree with rough and shaggy bark, consisting of long strips adhering by the middle or one end; the wood is valuable as timber, and especially for fuel. The fruit is covered with a very thick epicarp separating into 4 parts, and containing a whitish thin-shelled nut with a large richly-flavored kernel.

2. C. SULCATA, Nutt. *Thick Shell-bark Hickory.*

Leaflets 7 to 9, obovate-lanceolate, downy underneath, sharply serrate; *fruit* oval, 4-ribbed above the middle with intervening furrows; *nut* strongly pointed, slightly flattened, with a thick yellowish shell.

Valleys along the Alleghenies; abundant along Chillisquaque Creek, Northumberland County. May; *fruit* in Oct. A large tree 50 to 70 feet high. *Leaves* 10 to 20 inches long. *Sterile aments* very long. *Nut* nearly twice larger than in C. alba, with a thick shell.

* * *Seed sweetish but small; nut hard-shelled; bark not shaggy.*

3. C. TOMENTOSA, Nutt. *Mockernut. Bullnut Hickory.*

Leaflets 7 to 9, oblong or obovate-lanceolate, slightly serrate, roughish downy underneath; *aments* hairy; *fruit* globular or ovoid, with a thick and hard shell, which splits almost to the base; *nut* somewhat 6-angled, the shell very thick and hard.

Rich woods and hills, common. April. May; *fruit* in Oct. A tall tree 40 to 50 feet high, with resinous scented foliage and whitish cracked bark; the wood is celebrated for axe-handles, fuel, &c.

4. C. MICROCARPA, Nutt. *Small-fruited Hickory.*

Leaflets 5 to 7, oblong-lanceolate, serrate, glandular underneath; *aments* smooth *fruit* roundish-ovoid, with a thin husk; *nut* slightly 4-angled, the shell rather thin.

Moist woodlands. May; *fruit* in Oct; A tree 60 to 70 feet high with an even bark. *Aments* long, slender, smooth. *Leaves* 4 to 8 inches long, 2 to 3 inches wide, the under surface tufted in the axils of the veinlets. *Fruit* ¾ of an inch in diameter.

5. C. GLABRA, Torr. *Pig-nut. Broom Hickory.*

Leaflets 5 to 7, ovate-lanceolate, serrate, smooth or nearly so; *fruit* pear shaped or roundish obovate, thin, splitting about half way down into 4 coriaceous valves; *nut* hard and tough with a sweetish or bitterish kernel.

Woodlands, common. May; *fruit* in Oct. A large tree with a close bark very tough and valuable wood, and exceedingly tough sprouts. *Fruit* of various forms.

* * * *Seed intensely bitter; husk thin and soft; nut-shell thin and fragile.*

6. C. AMARA, Nutt. *Bitter-nut. Swamp Hickory.*

Leaflets 7 to 11, oblong-lanceolate, serrate, smooth, acuminate: *fruit* globular, with ridged or prominent seams opening half way down; *nut* inversely heart-shaped.

Wet woods, common. May; *fruit* in Sept. A graceful tree with close bark, and small pointed buds nearly destitute of scales. *Nut-shell* very thin, with an intensely bitter kernel.

ORDER 103. CUPULIFERÆ.—*Oak Family.*

Trees or shrubs, with alternate and simple straight-veined leaves, deciduous stipules, and monœcious flowers; the sterile in aments or clusters, the fertile solitary or clustered, furnished with an involucre which forms a cup or covering to the 1-celled 1-seeded nut. STAMENS 1 to 3 times as many as the sepals, inserted into their base. OVARY 2 to 7-celled, with 1 to 2 pendulous anatropous ovules in each cell; all the ovules and cells disappearing in fruit. FRUIT a bony or leathery nut, more or less enclosed in the capsule.

1. QUERCUS, Linn. OAK.

The classical Latin name.

STERILE FLOWERS clustered in slender and naked drooping aments, without bracts; PERIANTH 6 to 8-parted. STA-

MENS 6 to 12: ANTHERS 2-celled. FERTILE FLOWERS scattered or somewhat clustered, consisting of a 3-celled 6-ovuled ovary with a 3 lobed stigma, inclosed by a scaly bud-like involucre which becomes an indurated cup (*cupule*) around the base of the rounded nut or acorn.—*A noble genus of trees* (rarely shrubs), *with greenish or yellowish sterile flowers, in axillary, pendulous filiform aments; the fertile inconspicuous: flowering in* April and May, *and ripening their fruit in October.*

SEC. I. FRUIT annual, pedunculate.—LEAVES not mucronate.

* *Leaves sinuate-lobed or pinnatifid.* WHITE OAKS.

1. Q. ALBA, L. *White Oak.*

Leaves smooth, pale or glaucous underneath, obovate-oblong, obtuse, obliquely and deeply cut into 3 to 6 oblong, obtuse mostly entire lobes; *cup* hemispherical, roughish, naked, much shorter than the ovoid or oblong acorn.

Rich woods, common. The White Oak is a well known and invaluable tree 70 to 80 feet high, with a diameter of 4 to 6 feet. *Leaves* bright green above, the lobes variable in breadth, sometimes very narrow. *Nut* about 1 inch long, sweetish, edible.

2. Q. OBTUSILOBA, Michx. *Post Oak. Iron Oak.*

Leaves deeply cut into 5 to 7 roundish divergent lobes, the upper ones much longer and often 1 to 3-notched, grayish-downy underneath, pale and rough above; *cup* hemispherical, naked, about ⅓ the length of the ovoid acorn.

Sandy soil, not common. May. A tree 30 to 50 feet high, with straggling irregular branches. *Fruit* sessile, or 2 to 3 together on a short common peduncle. The timber is very durable, and is much esteemed in ship building.

3. Q. MACROCARPA, Michx. *Over-cup White Oak.*

Leaves obovate, deeply and lyrately sinuate-lobed, pale or downy underneath, the *lobes* obtuse, repand; *cup* deep, fringed around the margin, more than half enclosing the ovoid turgid acorn.

Woods along rivers, rare. May. A tree 40 to 60 feet high, the branches covered with a corky bark. *Leaves* dark-green, 10 to 15 inches long. *Acorns* very large immersed ⅔ of their length in the cup which is mossy-fringed on the border.

4. Q. OLIVÆFORMIS, Michx. *Mossy-cup Oak.*

Leaves oblong, deeply and unequally sinuate-pinnatifid, smooth, glaucous underneath; *cup* very deep, mossy-fringed above, inclosing ¾ of the elliptical-oval acorn.

Swamps and low places, not common. A large and majestic tree 60 to 80 feet high, with a diameter of 2 to 4 feet, chiefly remarkable for its smaller branches always inclining downwards. *Leaves* very variable in form. *Fruit* 1¼ inch long. This species is commonly known through Union County as the Swamp White Oak, and is considered very durable for posts, rails, &c.

* * *Leaves coarsely sinuate-toothed, not lobed.* CHESTNUT OAKS.

5. Q. BICOLOR, Willd. *Swamp White Oak.*

Leaves on short petioles, oblong-obovate, cuneate at the base, whitish-downy beneath, coarsely and irregularly sinuate-toothed; *peduncle* elongated in fruit; *cup* hemispherical, sometimes a little fringed at the border, inclosing less than one half the oblong-ovoid acorn.

Low moist woods, common. A tree 40 to 60 feet high, with the bark separating into large flat plates. *Leaves* 6 to 7 inches long, with 8 to 15 coarse teeth. *Acorn* large, in a small thin and roughish cup.

6. Q. PRINUS, L. *Swamp Chestnut Oak.*

Leaves on long petioles, obovate, acute, coarsely serrate with nearly uniform roundish teeth, pubescent beneath; *cup* somewhat top-shaped; *acorn* ovate.

Shady woods and river banks. A tree 60 to 80 feet high. *Leaves* large on petioles 1 inch long. *Acorn* large, sweet. The timber is valuable in the arts.

7. Q. MONTANA, Willd. *Rock Chestnut Oak.*

Leaves petioled, broadly obovate, coarsely and nearly equally toothed, whitish downy underneath; *peduncles* short; *cup* hemispherical, with rugose and tubercled scales; *acorn* ovate.

Rocky hills, common. A middle sized tree, seldom more than 60 feet high. *Leaves* with broad and obtuse teeth on a yellow petiole. *Acorn* 1 to 1½ inch long. The bark is highly esteemed for tanning, and the wood makes excellent fuel.

8. Q. CASTANEA, Willd. *Yellow Chestnut Oak.*

Leaves on long petioles, oblong-lanceolate, obtuse at base, acuminate, hoary-white underneath, equally and nearly sharply toothed; *cup* hemispherical; *acorn* ovoid.

Rich [illegible] and valleys. A tree 60 to 70 feet high. *Leaves* narrower than [illegible] former, with acute teeth, which are callous at the point. *Fruit* middle [illegible] or on a short peduncle. These three Chestnut Oaks are very difficult [illegible], and many prove to be only varieties of one species.

9. Q. PRINOIDES, Willd. *Chinquapin Oak.*

Leaves on short petioles, obovate and lance-oblong, coarsely wavy-toothed, downy underneath; *peduncles* short or none; *cup* hemispherical; *acorn* ovoid. (Q. Chinquapin, Pursh.)

Sandy soil. A shrub 3 to 6 feet high, growing in patches intermingled with the Black Scrub Oak. (Q. illicifolia, Wang.) *Acorns* sweet, middle-sized, and so abundant as often to weigh the shrub to the ground. *Dwarf Chestnut Oak.*

SEC. II. *Fruit* not maturing until the second year, nearly sessile.

* *Leaves entire, narrow.*

10. Q. IMBRICARIA, Michx. *Laurel or Shingle Oak.*

Leaves lance-oblong, acute at both ends, mucronate, thickish, smooth and shining above, pubescent beneath; *cup* saucer-shaped; *acorn* globular.

Barrens and open woodlands. A tree 30 to 50 feet high, with numerous irregular branches. *Leaves* dark green, thick and firm in texture, 3 to 5 inches long, ⅓ as wide. *Acorn* small, in a flat nearly sessile cup. The wood splits easily, and is sometimes used for shingles.

* * *Leaves toothed or lobed.* BLACK AND RED OAKS.

11. Q. ILLICIFOLIA, Wang. *Black Scrub Oak.*

Dwarf; *leaves* on short petioles, obovate, wedge-shaped at the base, 3 to 5-angularly lobed, white-downy underneath; *cup* flattish-top-shaped; *acorns* ovoid. (Q. Bannisteri, Michx.)

Sandy barrens and rocky hills, common. A straggling crooked shrub, 3 to 8 feet high, much branched. *Acorns* in numerous clusters on the branches. *Bear Oak.*

12. Q. NIGRA, L. *Black Jack, or Brown Oak.*

Leaves broadly wedge-shaped, rounded or somewhat heart-shaped at the base, dilated and slightly 3, or rarely 5-lobed at the end, rusty-downy underneath when young; *acorn* ovoid globular, half covered by the very scaly cup.

Dry woods and sandy barrens, common. A scraggy tree, 15 to 30 feet high, covered with a thick rough black bark. *Leaves* leathery, shining above, 4 to 8 inches long, with rounded often obscure lobes, the principal veins projecting in bristle points which are commonly deciduous. *Acorns* ⅝ to 1 inch long.

13. Q. TINCTORIA, Bartram. *Quercitron or Black Oak.*

Leaves obovate-oblong, slightly or sometimes deeply sinuate-lobed, the *lobes* somewhat toothed, more or less rusty pubescent underneath; *acorn* depressed-globose, in a flat scaly cup.

Dry woods common. A large tree, sometimes attaining the height of 80 to 90 feet, with a diameter of 4 to 5 feet, and a deeply furrowed black or deep brown bark. The inner bark is very thick and yellow, used in dying. *Leaves* 6 to 8 inches long, broadest towards the end, quite variable. *Acorns* brown, nearly sessile, about half covered with the thick scaly cup.

14. Q. COCCINEA, Wang. *Scarlet Oak.*

Leaves on long petioles, oval in outline, deeply sinuate-pinnatifid, with broad and open sinuses, the *lobes* divergent and sparingly cut-toothed, 3 to 4 on each side, smooth; *cup* top-shaped, conspicuously scaly; *acorn* roundish-ovoid.

Rich woods, common. A tree 60 to 80 feet high, with a diameter of 3 or 4 feet. *Leaves* of a bright shining green on both sides, turning bright scarlet in autumn. *Acorns* large $\frac{1}{3}$ to $\frac{1}{2}$ immersed in the cup. The wood is used for staves, and the bark for tanning.

15. Q, RUBRA, L. *Red Oak.*

Leaves on long petioles, oblong, smooth, pale beneath, obtusely sinuately-lobed; *lobes* spreading, sparingly-toothed or entire, 4 to 6 on each side; *cup* saucer-shaped, shallow, nearly smooth, much shorter than the oblong-ovoid acorn.

Forests, common. A tree 70 to 80 feet high, with a diameter of 3 to 4 feet. *Leaves* 6 to 10 inches long, slightly pubescent in the axils of the nerves beneath, changing to dull red or yellowish in autumn. *Acorns* 1 inch long, with a flat base in cups so shallow as rather to resemble saucers than cups, eagerly devoured by hogs. The wood is reddish and coarse grained, and the bark is used in tanning.

16. Q. PALUSTRIS, Du Roi. Michx. *Pin Oak.*

Leaves on long petioles, oblong, in outline smooth and shining, deeply pinnatifid with broad and rounded sinuses, the *lobes* divergent, cut-lobed and toothed, acute; *cup* saucer-shaped, even; *acorn* nearly globose.

Swampy woods, common. A handsome tree 40 to 60 feet high, with numerous spreading branches and light elegant foliage. *Leaves* bright green on both sides. *Acorns* numerous, small, on short peduncles, in shallow cups. It is called Pin Oak on account of its unusual number of secondary branches which die as the tree advances, giving the trunk the appearance of having *pins* or tree nails driven into it.

Q. *heterophylla*, Michx., f., was founded on a single tree raised in Bartram's garden near Philadelphia, recently destroyed, which was doubtless a hybrid. It is figured and described by Michaux in his Sylva Americana.

2. CASTANEA, Tourn. CHESTNUT.

From *Castanea*, a city of Thessaly, noted for its chestnuts.

Polygamous. STERILE FLOWERS interuptedly clustered in long cylindrical aments: PERIANTH deeply 5 to 6-parted: STAMENS 8 to 15. FERTILE FLOWERS 2 or 3 together in an ovoid scaly prickly involucre: PERIANTH urceolate, 5 to 6-cleft, with the rudiments of 5 to 12 abortive stamens. OVARY crowned with the perianth, 3 to 7-celled, 14 to 25-ovuled. NUTS coriaceous, ovoid, 1 to 3 included in the enlarged echinate 4-lobed involucre.—*Trees and shrubs, with mostly deciduous alternate straight veined leaves, the sterile cream-colored* *flowers in axillary aments near the end of the branches, and the fertile flowers at their base.*

1. C. VESCA, L. *Chestnut.*

Leaves oblong-lanceolate, pointed, mucronate-serrate, smooth and green on both sides; *nuts* 2 to 3 in each involucre, flattened on one or both sides.

Rocky or hilly woods, common, especially in stony land. June, July. A large tree, with light coarse grained wood. *Leaves* 6 to 9 inches long, and ½ as wide with large uniform teeth. *Aments* 5 to 8 inches long, very numerous. *Nuts* about 3 together, of a peculiar brown, enclosed in the enlarged cupule or burr which is beset on all sides with sharp spines.

2. C. PUMILA, Michx. *Chinquapin. Dwarf Chestnut.*

Leaves oblong, acute, serrate with pointed teeth, white-downy beneath; *nut* solitary.

Sandy woods, and sterile places. June. A shrub or small tree 6 to 20 feet high, much branched. *Leaves* 3 to 5 inches long, 1½ to 2 inches wide, smooth above, on petioles ½ inch long. *Staminate flowers* in aments 6 to 10 inches long. *Nut* ovoid, pointed, scarcely half as large as a common chestnut, very sweet.

3. FAGUS, Tourn. BEECH.

Gr. *phago*, to eat, in allusion to the esculent nuts.

Monœcious. STERILE FLOWERS in small heads on drooping peduncles, with deciduous scale-like bracts; PERIANTH bell-shaped, 5 to 6-cleft: STAMENS 8 to 12. FERTILE FLOWERS 2 within a 4-lobed prickly involucre: PERIANTH with 4 to 5 minute awl-shaped lobes. STYLES 3: OVARY 3-celled with 2 ovules in each cell. NUTS usually 2, sharply 3-sided, invested by the soft prickly coriaceous involucre, which splits to below the middle into 4-valves.—*Trees with smooth gray bark, undivided straight-veined leaves, and yellowish flowers appearing with the leaves.*

F. FERRUGINEA, Ait. *American Beech.*

Leaves oblong-ovate, acuminate, distinctly and often coarsely toothed, obtuse at base; *prickles* of the fruit recurved or spreading.

Woods along streams, common. May. A beautiful tree, often 50 or 60 feet high, covered with thick smooth ash-gray bark. *Leaves* 2 to 5 inches long, often a little heart-shaped at base, bright green and shining above, silky underdeath when young. *Nuts* small, oily, sweet and nutritious. The *Red Beech* is now considered as only a variety, with the wood softer and easier of cleavage.

4. CORYLUS, Tourn. HAZEL-NUT. FILBERT.

Gr. *korus*, a helmet or cup, in allusion to the involucre.

Monœcious. STERILE FLOWERS in drooping cylindrical aments, the concave bracts and the 2-cleft perianth combined to form 3-lobed scales, to the axis of which the 8 short filaments irregularly cohere. FERTILE FLOWERS several together in lateral and terminal scaly buds. STIGMA 2, thread-like. OVARY 2-celled with 1 ovule in each cell. NUT long, roundish-ovoid, obtuse, surrounded by the enlarged coriaceous and laceratcly toothed involucre.—*Shrubs, with roundish unequally serrate leaves, the yellowish sterile and red fertile flowers appearing in early spring in advance of the leaves.*

1. C. AMERICANA, Walt. *Wild Hazle-nut.*

Leaves roundish-heart-shaped, acuminate, coarsely serrate; *involucre* roundish bell-shaped, glandular, with a spreading flattened border about twice the length of the flattened nut.

Thickets and fencerows, common. A shrub 5 to 8 feet high, with the young twigs, &c., downy and glandular hairy. *Leaves* 3 to 6 inches long and ⅔ as wide. *Barren flowers* in long pendulous aments flowering in April. Nut fine-flavored smaller than the European hazel or *filbert.*

2. C. ROSTRATA, Ait. *Beaked Hazle-nut.*

Leaves oblong-ovate, somewhat heart-shaped, acuminate, doubly serrate; *involucre* bell-shaped-tubular, prolonged above the globular-ovoid nut into a narrow tubular beak, densely clothed with bristles

Banks of streams and along mountain ravines. May. A shrub 2 to 5 feet high with slender smooth branches. *Involucre* 1 to 1½ inch long, contracted at the top into a long narrow neck, like a bottle, covered with short stiff hairs.

5. CARPINUS, Linn. HORNBEAM. IRON-WOOD.

The ancient Latin name.

Monœcious. STERILE FLOWERS in drooping cylindrical aments, consisting of from 8 to 14 stamens in the axil of a simple entire scale-like bract, destitute of a proper calyx: filaments very short. FERTILE FLOWERS several, spiked in an oblong loosely imbricated terminal ament, with small deciduous bracts, each with a pair of flowers consisting of a 2-celled 2-ovuled ovary terminated by 2 thread-like stigmas. NUT small, ovoid, ribbed, acute, each with a simple, 1-seeded, enlarged, open and leaf-like involucre.—*Trees with a smooth gray bark, with alternate undivided straight-veined leaves appearing later than the flowers.*

C. AMERICANA, Michx. *American Hornbeam.*

Leaves ovate-oblong, acuminate, sharply doubly serrate, nearly smooth; *involucre* 3-lobed, somewhat halbert-shaped, somewhat cut-toothed on one side.

Woods along streams, common. April, May. A small tree 12 to 20 feet high with an irregular rigid trunk, and very hard wood, covered with a light ash-colored or gray bark. *Leaves* 2 to 4 inches long, ½ as wide, petiolate. *Scales* of the fertile ament 3-parted, the middle segment much the largest, oblique with a lateral tooth.

6. OSTRYA, Micheli. HOP HORNBEAM.

Gr. *ostreon*, a shell; in allusion to the fruit.

Monœcious. STERILE FLOWERS in cylindrical aments, with orbicular, acuminate, ciliate scales. STAMENS 8 to 10, with somewhat irregularly united filaments. FERTILE FLOW-

ERS numerous, in a short terminal ament, with small deciduous bracts; each enclosed in a membranaceous sac-like involucre which enlarges and forms a bladdery closed bag in fruit, those imbricated to form a sort of strobile, appearing like that of the hop. OVARY 2-celled, 2-ovuled, crowned with the entire and bearded border of the calyx, forming a small and seed-like smooth nut.—*Slender trees with brownish finely furrowed bark, entire alternate leaves, and flowers appearing with the leaves.*

O. VIRGINICA, Willd. *American Hop-Hornbeam.*

Leaves oblong-ovate, acuminate, sharply doubly serrate, somewhat downy *fertile aments* oblong, pendulous; *involucral sacs* bristly-hairy at the base; *buds* acute.

Rich woods. April, May. A small tree 20 to 30 feet high. The bark is remarkable for its fine narrow longitudinal divisions. *Leaves* on hairy petioles, about twice as long as wide. The fruit is similar in appearance to hops, consisting of membraneous imbricated sacs, containing each a flower. The wood is very white, hard and strong, much used for levers, &c. *Lever-wood. Iron-wood.*

ORDER 104. MYRICACEÆ.—*Sweet Gale Family.*

Monœcious or diœcious shrubs, with the sterile and fertile flowers in short scaly aments, and resinous dotted often fragrant leaves—differing from the Birch Family chiefly by the 1-celled ovary with a single erect orthotropous ovule, and a drupe-like nut.

1. MYRICA, Linn. BAYBERRY.

Gr. *murike*, the ancient name of the Tamarisk.

Diœcious. STERILE FLOWERS in oblong or cylindrical aments, the FERTILE in ovoid closely imbricated aments, both destitute of calyx and corolla, solitary under a scale-like bract, with a pair of bractlets. STAMENS 2 to 8 with the filaments somewhat united below. OVARY 1, superior, with 3 scales at its base, and 2 thread-like stigmas. FRUIT a small globular nut, studded with resinous grains or wax.

1. M. GALE, L. *Sweet Gale. Meadow Fern.*

Leaves wedge-lanceolate, serrate towards the apex, appearing later than the flowers; *sterile aments* closely clustered; *fruit* in an oblong imbricated amentaceous head.

Borders of ponds and mountain lakes, rare. May. A branching shrub 3 to 4 feet high. *Leaves* dark green above, pale beneath, with a strong midvein. ¾ to 1½ inch long, ⅓ to ½ inch wide, entire ⅓ the length. *Fertile* and *sterile flowers* on seperate plants. The fruit and leaves when bruised emit a pungent spicy odor.

2. M. CERIFERA, L. *Bayberry. Wax Myrtle.*

Leaves oblong-lanceolate, narrowed at the base, entire or wavy-toothed towards the apex, shining and resinous dotted on both sides, somewhat preceding the flowers; *sterile aments* scattered, oblong; *nuts* scattered and naked, incrusted with white wax.

Sandy soil, rare. May. A shrub 2 to 8 feet high, with a very branching top, and grayish bark. *Leaves* 1½ to 2½ inches long by ½ to ¾. *Aments* sessile along the last years branches. The fruit consists of a globular nut or stone enclosing a kernel, and covered with a coating of whitish wax.

2. COMPTONIA, Solander. SWEET FERN.

In honor of *Henry Compton*, Bishop of London a century ago, a patron of botany.

Monœcious. STERILE FLOWERS in cylindrical aments with reniform-cordate pointed scale-like bracts, and 3 to 6 stamens. FERTILE FLOWERS in globular aments, burr-like; OVARY surrounded by 5 to 6 long linear-awl-shaped scales, persistent around the ovoid smooth nut; otherwise as in Myrica.—*Low shrubs, with long and narrow pinnatifid-lobed leaves with small stipules appearing after the flowers.*

C. ASPLENIFOLIA, Ait. *Sweet Fern.*

Leaves long linear-lanceolate, alternately sinuate-pinnatifid.

Dry woods and hills, common. May. A well known, handsome aromatic shrub, 1 to 2 feet high. *Leaves* numerous, on short peduncles, 3 to 4 inches long, ½ inch wide, divided nearly to the midvein into numerous rounded lobes.

ORDER 105. BETULACEÆ.—*Birch Family.*

Monœcious trees or shrubs, with sterile and fertile flowers in scaly aments, 2 or 3 under each bract, and no involucre to the naked 1-celled and 1-seeded often winged nut, which results from a 2-celled and 2-ovuled ovary. STYLES single or none: STIGMA 2.

1. BETULA, Tourn. BIRCH.

The ancient Latin name.

STERILE FLOWERS 3, with 2 bractlets under each scale or bract of the ament, consisting each of a perianth of 1 scale and 4 stamens attached to its base: FILAMENTS short. FERTILE FLOWERS 3 under each 3-lobed bract, consisting of a naked ovary with 2 thread-like stigmas, becoming a broadly winged and scale-like nutlet or small samara. SEED suspended, anatropous.—*Trees and shrubs, mostly with the outer bark usually separable in thin horizontal sheets, ovate, serrate alternate leaves, and monœcious flowers, the golden sterile ones expanding in early spring preceding the leaves, the fertile in oblong cylindrical aments appearing with the leaves.*

* *Trees with the bark of the trunk white externally, separable in thin sheets.*

1. B. POPULIFOLIA, Ait. *White Birch.*

Leaves deltoid (triangular), long acuminate, truncate or slightly cordate at base, unequally serrate, smooth and shining on both sides, on smooth petioles; *fertile aments* on peduncles; *scales* with roundish, lateral lobes.

Poor soils, in rocky mountainous woods, common. May. A small and slender, very graceful tree, 20 to 40 feet high, with a chalky-white bark. *Leaves* tapering to a long point as tremulous as an Aspen, on petioles 1 inch or more long. *Aments* long pendulous. *Poplar-leaved Birch.*

2. B. PAPYRACEA, Ait. *Paper Birch. Canoe Birch.*

Leaves ovate, acuminate, doubly-serrate, the veins hairy beneath, small above; *lateral lobes* of the fruit-bearing bracts short and rounded.

Hillside woods, common. May, June. A tree 40 to 70 feet high, with fine-grained wood, and very tough durable bark, white externally, seperating into paper-like layers. *Leaves* 2 to 3 inches long, ½ as wide dark-green above, pale glandular-dotted underneath. *Sterile aments* 1 to 2 inches long.

* * *Trees with reddish-brown or yellowish bark; leaves with short petioles.*

3. B. NIGRA, L. *Red Birch. River Birch.*

Leaves rhombic-ovate, acute at each end, doubly serrate, whitish and downy underneath; *fertile aments* somewhat peduncled, woolly; *bracts* with oblong-linear nearly equal lobes.

Low river banks, common. May. A tree 30 to 50 feet high, with reddish-brown bark, which at length becomes very loose and torn, hanging in shreds. *Leaves* 3 inches long and 2 wide, on petioles ½ to ¾ inch long, dark-green above.

4. B. LENTA, L. *Black Birch. Sweet Birch.*

Leaves cordate-ovate, pointed, sharply and finely doubly serrate; hairy on the veins beneath; *fertile aments* elliptical, thick, erect, somewhat hairy.

Moist rich woods, common. April, May. A beautiful tree 40 to 60 feet high, with a diameter of 1 to 3 feet, covered with a chestnut-brown dark. *Branches* slender, spotted with white. *Leaves* 3 to 4 inches long, about ½ as wide. The wood has a close grain and is susceptible of a fine polish, valuable for cabinet work. The bark and young twigs are spicy-aromatic.

* * * *Shrubs with brownish bark and rounded crenate-toothed leaves.*

5. B. PUMILA, L. *Low Birch. Dwarf Birch.*

Erect or ascending; *leaves* obovate or roundish-elliptical, coarsely crenate-toothed, the younger downy and nearly orbicular; *fertile catkins* cylindrical; *scales* more or less unequal 3-lobed; *fruit* broadly winged.

Mountain bogs, rare. *Pursh.* May, June. A shrub 2 to 5 feet high, with smooth or sometimes warty branchlets, the young twigs downy. *Leaves* on short petioles, 1 to 1½ inch long, pale or whitish underneath.

2. ALNUS, Tourn. ALDER.

The ancient Latin name.

Monœcious. STERILE AMENTS long and drooping, cylindric, with 5 bractlets and 1 to 3 flowers under each scale; each flower with a 4-parted calyx and 4 stamens with very short filaments. FERTILE AMENTS ovoid or oblong, the fleshy scales each 2-flowered, with a calyx of 4 small scales coherent with the scales or bracts of the ament, which become thick and woody in fruit, all coherent below and persistent.—*Shrubs or small trees, arising from large and strong roots, stalked leaf-buds furnished with a single scale, alternate simple leaves, and the aments produced at the close of summer, and expanding in early spring.*

1. A. INCANA, Willd. *Black Alder.*

Leaves broadly oval or ovate, rounded at the base, sharply serrate, often coarsely toothed, white and mostly downy underneath; *stipules* oblong-lanceolate; *fertile aments* oval; *fruit* orbicular.

Banks of mountain streams, common. A shrub 8 to 20 feet high, with smooth brown bark. *Fertile aments* usually 4 to 5 in a paniculate raceme.

2. A. SERRULATA, Ait. *Common Alder. Smooth Alder.*

Leaves obovate, acute at the base, sharply serrate with acute teeth, thickish, smooth and green on both sides, a little hairy on the veins beneath; *stipules* oval; *fertile aments* ovoid-oblong; *fruit* ovate.

Borders of ponds and streams, common. A well known shrub 6 to 12 feet high, growing in clumps. *Leaves* 2 to 4 inches long and ⅔ as wide, strongly veined. *Aments* 2 to 3 inches long, slender, pendulous; the fertile ones short, thick, dark brown, persistent.

ORDER 106. SALICACEÆ.—*Willow Family.*

Diœcious trees or shrubs, with alternate undivided leaves, the fertile and sterile flowers in aments, one under each bract, entirely destitute of calyx or corolla; the fruit a 1-celled and 2-valved capsule, containing numerous seeds clothed with a long silky down. OVARY 1-celled or imperfectly 2-celled; STYLES 2, very short, or more or less united, each with a 2-lobed stigma.

1. SALIX, Tourn. WILLOW. OSIER.

Celtic, *sal*, near, and *lis*, water; alluding to their usual locality.

Diœcious. AMENTS cylindric, with entire imbricated scales. STERILE FLOWERS of 2 to 6 stamens, accompanied with 1 or 2 little glands. FERTILE FLOWERS with a small flat gland at the base of the ovary on the inner side; STIGMAS short.—*Trees or shrubs, generally growing along streams, with round and flexible branches, mostly long and pointed leaves, entire or glandularly-toothed, and terminal and lateral aments appearing before or with the leaves.*

SEC. I. *Aments* lateral and sessile, appearing before the leaves. *Shrubs* or small trees.

* *Leaves entire or obscurely wavy-toothed; aments ovoid or short-cylindrical, small; stigmas 2 cleft.*

1. S. CANDIDA, Willd. *Hoary or White-leaved Willow.*

Leaves narrow-lanceolate, acuminate, or the lowest obtuse, pubescent above, white-tomentose beneath; *stipules* small, lanceolate, toothed; *aments* oblong-cylindrical, closely flowered; *ovary* densely woolly; *style* distinct.

Bogs in shady woods, rare. April, May. A shrub 2 to 5 feet high with reddish twigs, smooth and shining at maturity. *Leaves* 8 to 12 inches long, 1 to 2 wide. *Aments* about an inch long, dense on short peduncles.

2. S. TRISTIS, Ait. *Dwarf Gray Willow.*

Leaves wedge-lanceolate, almost sessile, pointed, or at the lower obtuse grayish-woolly on both sides, the upper side at maturity nearly smooth; *stipules* small, hairy; *aments* globular when young, loosely flowered; *ovary* with a long hairy beak; *style* short.

Sandy woods. March, April. A small shrub 1 to 1½ foot high, much branched, with a profusion of aments in spring appearing before the leaves. *Leaves* at length numerous, thick, 1½ inch long, often crowded. *Stipules* seldom seen, often reduced to a mere gland.

3. S. HUMILIS, Marshall. *Low Bush Willow.*

Leaves on petioles, lanceolate or obovate-lanceolate, acute or obtuse with an abrupt point, slightly downy above; *stipules* small, semi-ovate and entire, or larger and linear with 2 to 4 teeth, shorter than the petioles; *aments* often recurved; *ovary* hairy; *style* distinct.

Borders of fields and roadsides, common. A shrub 3 to 8 feet high, varying in size and appearance. *Leaves* of the larger forms 3 to 5 inches long, and ¾ to 1 inch broad. This species, as well as some of the following section often bear cone-like excrescences on the ends of the branches, formed of closely imbricated leaves.

* * *Leaves more or less serrate, smooth and shining above; aments cylindrical, large.*

4. S. DISCOLOR, Muhl. *Glaucous Willow.*

Leaves lanceolate or ovate-lanceolate, acute, irregularly toothed on the sides, entire at the base and apex; *stipules* semilunar, toothed; *aments* erect; *scales* very hairy, oblanceolate, somewhat acute; *ovary* densely silky.

Low meadows and river banks, common. A large shrub or small tree 8 to 15 feet high. *Leaves* when young commonly obtuse and pubescent, at length becoming smooth and whitish-glaucous beneath. *Young catkins* 1½ inch long, glossy, blackish with the conspicuous stipules, elongating in fruit to 2½ inches.

* * * *Leaves finely and evenly serrate, silky-gray or glaucous beneath; aments ovoid or cylindrical; stigma 2-lobed. Shrubs.*

5. S. SERICEA, Marshall. *Silky-leaved Willow.*

Leaves lanceolate, pointed, downy above, grayish with short silky hairs underneath; *sterile aments* small, the fertile narrowly cylindrical, closely flowered; *scales* obtuse, round-obovate: *stigma* nearly sessile.

Sandy river banks. A shrub 4 to 10 feet high, with green or purple twigs which are tough but brittle at base. *Fertile aments* in flower ¾ inch, at length 1¼ inch long. *Anthers* at first reddish, then yellow, and finally brown.

6. S. PETIOLARIS, Smith. *Long-stalked Willow.*

Leaves lanceolate, pointed, smooth above, glaucous beneath, silky at base, mostly unequal; *stipules* lunate; *aments* appearing before the leaves, the *fertile* ovoid-cylindrical, loosely flowered; *scales* very hairy, obovate; *style* short but distinct.

Sandy river banks and low grounds, common. A shrub 6 to 10 feet high, somewhat resembling the last, but the mature leaves are smooth beneath, and dry less black. *Fertile aments* shorter and broader, the capsule spreading and showing the stalks.

* * * * *Filaments seperate; stigmas undivided. Small trees.*

7. S. VIMINALIS, L. *Basket Osier. Basket Willow.*

Leaves linear-lanceolate, very long and acuminate, entire or obscurely crenate, white-silky beneath; *stipules* very small; *aments* cylindrical-ovoid, clothed with long silky hair; *ovary* long and narrow; *styles* elongated; *stigmas* linear, mostly entire.

Wet meadows; introduced from Europe. A middle sized tree, with slender and flexible branches. *Leaves* 3 to 6 inches long of a beautiful lustre beneath. *Filaments* yellow. *Anthers* orange. Considered the best species for basket making.

SEC. II. *Aments* lateral, with 4 to 5 leafy bracts at the base, appearing with or before the leaves: *stamens* 2.—*Shrubs or small trees.*

8. S. CORDATA, Muhl. *Heart-leaved Willow.*

Leaves lanceolate or ovate-lanceolate, sometimes truncate or heart-shaped at base, acuminate, sharply toothed, smooth, paler beneath; *stipules* reniform or ovate, toothed, often large and conspicuous, or sometimes small and almost entire; *aments* appearing with the leaves, leafy at base, cylindrical, the *fertile* elongating in fruit.

Low river banks and low meadows. A shrub 2 to 6 feet or a small tree 6 to 15 feet high, with leaves 4 to 6 inches long. *Fertile aments* 2 to 3 inches long.

9. S. ANGUSTATA, Pursh. *Narrow-leaved Willow.*

Leaves lanceolate, acute, long and tapering to the base, slightly toothed, smooth and scarcely glaucous beneath; *stipules* semi-cordate; *aments* large, appearing before the leaves; *ovary* tapering into a long style.

Banks of streams. A large shrub or small tree 8 to 15 feet high, with very long and slender twigs, and long and narrow leaves.

SEC. III. *Aments* peduncled (long and loose) borne on the summit of lateral leafy branches of the season.—*Shrubs and trees, with the branches very brittle at the base.*

* *Ovary sessile, smooth; stamens 2.*

10. S. ALBA, L. *White Willow. Yellow Willow.*

Leaves lanceolate or elliptic-lanceolate, pointed, toothed, clothed more or less with white silky hairs, especially beneath; *stipules* lanceolate; *stigmas* nearly sessile thick and recurved. An introduced tree of rapid growth, attaining a height of 50 to 80 feet, with several varieties. Var. 1, VITELLINA, has yellow or light red branches; *leaves* shorter and broader. (S. vitellina, *Smith & Borrer*. S. Pameachiana, *Barret.*) Var. 2, CÆRULEA has the leaves nearly smooth at maturity.

* * *Ovary stalked, smooth; stamens 2 to 6.*

11. S. FRAGILIS, L. *Brittle Willow. Crack Willow.*

Leaves lanceolate, acuminate, smooth, glaucous beneath, serrate with inflexed teeth; *stipules* semicordate, pointed, toothed; *stamens* mostly 2.

A tall and handsome tree, with smooth and shining branches, introduced from Europe, and cultivated for basket-work, with several varieties. Var. 1, DECIPIENS, has dark brown buds, and the lowest leaves on the branches broadly obovate, very obtuse. (S. decipiens, *Hoffman.*) Var. 2, RUSSELIANA, has the leaves long and bright, strongly serrate, the younger ones, and upper branches of the annual shoots, silky-downy; *stipules* large and acuminate. (S. Russeliana, *Smith.*)

12. S. NIGRA, Marshall. *Black Willow.*

Leaves narrowly-lanceolate, pointed and tapering at each end, serrate, mostly smooth, green on both sides; *stipules* small, deciduous; *glands* of the sterile flowers 2, large and deeply 2 to 3-cleft; *stamens* 3 to 6.

Margins of streams. A tree 15 to 25 feet high, with a rough black bark. *Branches* very brittle at base, pale yellow. *Sterile aments* 3 inches long, and often with but 3 stamens in the upper scales.

13. S. LUCIDA, Muhl. *Shining Willow.*

Leaves ovate oblong or lanceolate and narrow with a long acumination, smooth and shining on both sides, serrate; *stipules* oblong, toothed; *stamens* mostly 5.

Overflowed banks of streams. A handsome species, sometimes 12 to 15 feet high, often flowering at the height of 3 or 4 feet. *Branches* smooth, dark shining green. *Leaves* broad and glossy above.

14. S. BABYLONICA, Tourn. *Weeping Willow.*

Branches pendulous: *leaves* lanceolate, acuminate smooth, glaucous beneath; *stipules* roundish, oblique, acuminate; *ovary* sessile, ovate, smooth. This beautiful species is a native of the East, and has been cultivated until nearly naturalized. The long slender drooping branchlets very naturally indicate the common name of the tree. Only the fertile plant is known in the United States.

*** *Ovary stalked, hairy; stamens* 2.

15. S. LONGIFOLIA, Muhl. *Long-leaved Willow.*

Leaves linear-lanceolate, very long, tapering at each end, nearly sessile, remotely denticulate with projecting teeth, clothed with gray hairs when young, at length nearly smooth; *stipules* small, lanceolate, toothed; *scales* hairy at the base, often glandular-toothed at the top in the sterile aments; *stigma* very long, sessile.

River banks. A variable rooting species 2 to 12 feet high, with brown branches and white branchlets, often prostrate.

2. POPULUS, Tourn. POPLAR. ASPEN.

Lat. *populus*, the people, being often planted by the public ways.

Diœcious. AMENTS cylindric. BRACTS (scales) of the aments irregularly cut-lobed at the apex. FLOWERS from a cup-shaped disk, which is obliquely lengthened in front. STAMENS 8 to 30, with distinct filaments. STIGMAS 4, elongated. CAPSULE superior, 2-celled, 2-valved, many-seeded. SEEDS comose.—*Trees, with soft wood, usually broad and more or less heart-shaped or ovate toothed leaves on long petioles, and long drooping aments, appearing before the leaves.*

1. P. TREMULOIDES, Michx. *American Aspen.*

Leaves roundish-heart-shaped, with a sharp short point, dentate-serrate, smooth on both sides, with downy margins; *scales* cut into 3 to 4 deep linear divisions, fringed with long hairs.

Woods and open fields, common. April. A tree 20 to 50 feet high, with smooth greenish-white bark. *Leaves* 2 to 2½ inches long, 2¼ to 3 wide, on petioles 2 to 3 inches long, which are laterally compressed, so that they are thrown into a continued agitation by the slightest breeze. *White Poplar.*

2. P. GRANDIDENTATA, Michx. *Large-toothed Aspen.*

Leaves roundish-ovate, with large and irregular sinuate teeth, white-silky-woolly when young, at length smooth on both sides; *scales* cut into 5 to 6 unequal small divisions, slightly fringed.

Woods and groves, rather common. A tree 40 to 50 feet high, with a diameter of 1 foot, straight, covered with a smooth, greenish bark. *Leaves* 3 to 5 inches long and nearly as wide, generally at the extremities of the distant, coarse and crooked branches.

3. P. HETEOPHYLLA, L. *Various-leaved Poplar.*

Leaves roundish-ovate or heart-shaped, obtuse, serrate, white-woolly when young, at length nearly smooth, except on the veins beneath.

Swamps. May. A tree 40 to 60 feet high, with round branches. *Leaves* large, usually quite blunt, the auricled lobes at the base often conceal the insertion of the petiole.

4. P. ANGULATA, Ait. *Water Poplar. Cotton-Wood.*

Leaves broadly-deltoid, or heart-ovate, smooth, crenate-serrate or cut-serrate, acuminate.

Banks of streams. March, April. A tree of large dimensions 40 to 80 feet high, and 1 to 2 feet thick, with acutely angled or winged branches. *Leaves* often 7 to 8 inches long, and about as wide on the young shoots; whilst on full-grown trees they are only 2 to 3 inches long. The buds are covered with resin.

5. P. BALSAMIFERA, L. *Balsam Poplar. Tacamahac.*

Leaves ovate-acuminate, finely serrate, smooth on both sides, white and reticulate-veined beneath; *scales* dilated, slightly hairy; *stamens* very numerous.

Borders of rivers and swamps, rare. April. A tree 60 to 70 feet high, and 1 to 1½ feet thick, with round branches. The buds are covered when young with a balsamic resin.

CULTIVATED SPECIES.

6. P. CANDICANS, Ait. *Balm-of-Gilead.*

Leaves ovate-cordate, acuminate, obtusely and unequally serrate, whitish beneath, somewhat 3-veined; *petioles* hirsute.

Woods, common in cultivation. April. A tree 40 to 50 feet high, and 18 to 30 inches in diameter, with smooth and greenish bark, and large dark green foliage. *Fertile aments* 6 inches long. The buds are covered with a balsamic resin, much used in domestic practice.

7. P. DILATATA, L. *Lombardy Poplar.*

Leaves smooth, deltoid, acuminate, serrate, about as wide as long; *trunk* lobed and sulcate. Native in Italy as its name imports. It has long been cultivated in this country, and is found in the vicinity of all old settlements.

8. P. ALBA, L. *Abele. Silver Poplar.*

Leaves heart-shaped, broad-ovate, lobed and toothed, acuminate, dark green and smooth above, very white downy beneath; *fertile aments* ovate; *stigmas* 4. A highly ornamental tree, native of Europe. The silvery whiteness of the lower surface of the leaves produce a striking contrast with the dark green of the upper.

ORDER 107. **BALSAMIFLUÆ.**—*Sweet-Gum Family.*

Trees, with a balsamic colorless juice, alternate palmately lobed leaves, deciduous stipules, and monœcious flowers in seperate roundish aments, destitute of calyx or corolla, the fruit of 2-beaked and 2-celled several-seeded woody capsules: consists only of the genus

LIQUIDAMBAR, Linn. SWEET-GUM.

Lat. *liquidum*, fluid, and Arabic *ambar*, amber, in allusion to the terebinthine juice that flows from the tree.

STERILE FLOWERS in conical clusters, naked. STAMENS numerous, intermixed with minute scales: FILAMENTS short. FERTILE AMENTS consisting of 2-celled ovaries, subtended by minute scales, all more or less cohering and hardening in fruit, forming a spherical head, the capsule opening between the 2 awl-shaped diverging styles. SEEDS small, often abortive.—*Tree, with alternate simple or lobed leaves deciduous stipules and racemed nodding aments, inclosed in the bud by a 4-leaved deciduous involucre.*

L. Styraciflua, L. *Sweet-Gum. Bilsted.*

Leaves rounded, deeply 5 to 7-lobed, smooth and shining, finely glandular-serrate, the lobes pointed.

Moist woods. April. A large and handsome tree, with finely grained wood and gray bark, with corky ridges on the branchlets. The young twigs are yellowish, putting forth leaves of a rich green, which are fragrant when bruised, turning deep red or crimson in autumn. *Fruit* when mature about 1 inch in diameter, forming a brownish woody and prickly strobile.

Order 108. **PLATANACEÆ.**—*Plane-tree Family.*

Trees, with alternate palmately-lobed leaves, sheathing stipules and monœcious flowers in seperate and naked spherical aments, destitute of calyx or corolla; the fruit club-shaped 1-*seeded nutlets, furnished with bristly down along the base:* consisting only of the genus

PLATANUS, Linn. Buttonwood.

Gr. *platus*, broad, in allusion to the ample shade of its foliage.

Sterile flowers of numerous stamens with clavate small scales intermixed: filaments very short. Fertile flowers in seperate aments consisting of inversely pyramidal ovaries mixed with little scales: style rather lateral, awl-shaped, or filiform, simple. Nutlets coriaceous, small, tawny-hairy below, containing a single orthotropous pendulous seed.

1. P. occidentalis, L. *American Plane* or *Sycamore.*

Leaves angularly-sinuate-lobed and toothed, the short lobes sharp-pointed; *fertile heads* solitary, suspended on a long peduncle.

Banks of streams. A very large and well-known tree, with a white bark seperating early in thin brittle plates. *Leaves* woolly when young, alternate, on long petioles. *Aments* axillary globose.

2. P. orientalis, L. *Oriental Sycamore.*

A handsome shade tree, native of the East, is occasionally met with in cultivation.

Order 109. **URTICACEÆ.**—*Nettle Family.*

Trees, shrubs and herbs, with alternate or opposite leaves, monœcious or diœcious flowers, furnished with a regular calyx, free from the mostly 1-*celled ovary which forms a* 1-*seeded utricle or achenium in fruit. Stamens as many as the lobes of the calyx and opposite them.* Comprising several very distinct suborders.

Suborder I. MOREÆ. The Mulberry Family.

Shrubs or trees with a milky juice. Fruit fleshy, composed of the fleshy calyx or receptacle.

1. MORUS, Tourn. MULBERRY.

Gr. *Morus*, the ancient name.

FLOWERS monœcious or diœcious; the two kinds in separate axillary ament like spikes. CALYX 4-parted, the sepals ovate. STAMENS 4: FILAMENTS elastically expanding. OVARY 2-celled, one of the cells smaller and disappearing: STYLES filiform, stigmatic down the inside. ACHENIUM ovate, compressed, covered by the succulent berry-like calyx, the whole fertile spike thus becoming a compressed berry.—*Trees, with milky juice, alternate mostly lobed leaves and inconspicuous flowers.*

1. M. RUBRA, L. *Red Mulberry.*

Leaves heart-ovate, serrate, rough above, downy beneath, pointed, sometimes variously lobed; *flowers* often diœcious; *fruit* dark purple.

Rich woods, common. May; *fruit* in July. A small spreading tree, covered with a grayish much broken and furrowed bark. *Leaves* 4 to 6 inches long, ⅔ as wide, entire or divided into lobes, thick, dark green. *Berries* compounded of a great number of small ones, of an agreeable acid flavor.

2. M. ALBA, L. *White Mulberry.*

Leaves obliquely heart-ovate, acute, serrate, sometimes lobed, smooth and shining: *fruit* whitish.

Naturalized near houses. A small tree, native of China. *Leaves* 2 to 4 inches long, ⅔ as wide, acute, petiolate. *Flowers* green, in small, roundish spikes or heads. This and the variety *multicaulis* are cultivated for feeding silkworms.

3. M. NIGRA, L. *Black Mulberry.*

Leaves scabrous, cordate, ovate or lobed, obtuse, unequally serrate; *fertile spikes* oval.—Native of Persia, cultivated for ornament. *Fruit* dark red or blackish, of an aromatic acid flavor.

2. BROUSSONETIA, L'Her.

In honor of *P. N. Broussonet*, a distinguished French naturalist.

FLOWERS polygamous, in cylindric aments. CALYX 4-parted. PISTILLATE AMENTS globose; RECEPTACLE cylindric-club-shaped, compound; CALYX 3 to 4-toothed, tubular. OVARIES becoming fleshy, club-shaped, prominent. STYLE lateral. SEEDS 1, covered by the calyx.—*Trees, native of Japan.*

B. PAPYRIFERA, L. *Paper Mulberry.*

Leaves of the younger tree, roundish-ovate, acuminate, mostly undivided, of the adult tree 3-lobed; *fruit* hispid.—A fine hardy tree, often cultivated, with a low bushy head, large, light green, downy leaves, and dark red fruit somewhat larger than peas, covered with long purple hairs.

3. MACLURA, Nutt.

Dedicated to *William Maclure*, Esq., of the U. S., a distinguished geologist.

FLOWERS polygamous, in aments. OVARIES numerous, coalescing into a compound globose fruit, composed of 1-seeded, compressed, angular, wedge-form carpels. STYLE 1, filiform, villous.—*A lactescent tree, with alternate entire leaves, without stipules, and axillary spines.*

M. AURANTIACA, Nutt. *Osage Orange. Bow-wood.*

Leaves ovate or ovate-oblong, obscurely denticulate, somewhat acuminate, coriaceous, smooth and shining above, strongly veined beneath. A beautiful tree, native on the banks of the Arkansas. *Leaves* 4 to 5 inches long, 1½ to 2½ wide, on short petioles. *Fruit* about as large as an orange, golden yellow when ripe, suspended by an axillary peduncle, which amidst the dark glossy foliage forms a beautiful contrast.

SUBORDER II. CANNABINEÆ. HEMP FAMILY.

Erect or twining herbs, with a watery juice. FLOWERS diœcious, the sterile racemed or panicled. STYLES 2. FERTILE FLOWERS in a cone-like ament.

4. HUMULUS, Linn. HOP.

Lat. *humus*, moist earth; the hop flourishes only in rich soil.

FLOWERS diœcious; the STERILE in loose axillary panicles: SEPALS and STAMENS 5. FERTILE FLOWERS in short axillary and solitary spikes or aments: BRACTS foliaceous, imbricated, each 2-flowered: CALYX 1-sepaled, embracing the ovary. ACHENIA invested with the enlarged scale-like calyx, together forming a membranaceous strobile.—*A rough perennial twining herb, with mostly opposite heart shaped, 3 to 5 lobed leaves and the flowers in axillary panicles and strobile-like aments.*

H. LUPULUS, L. *Hop.*

Leaves mostly 3-lobed, deeply cordate at base, on long petioles.

Banks of streams, truly indigenous. July. *Stem* twining with the sun. *Calyx-scales* in fruit covered with orange-colored resinous grains, in which the peculiar bitterness and aroma of the hop resides.

5. CANNABIS, Tourn. HEMP.

The ancient name, of obscure etymology.

FLOWERS diœcious; the STERILE in axillary compound racemes or panicles: SEPALS and STAMENS 5. FERTILE FLOWERS spiked-clustered, 1-bracted: CALYX of a single sepal, swollen at the base and folded round the ovary.—*A tall roughish annual, with digitate 5 to 7-parted leaves, and axillary flowers, the staminate in cymose panicles and the fertile in sessile spikes.*

C. SATIVA, L. *Common Hemp.*

Leaves palmately 5 to 7-foliate, the leaflets lanceolate, serrate, the middle one the largest.

Waste places, escaped from cultivation. June. A tall erect plant cultivated for the sake of its fibre, which is the best of all materials for cordage and sail-cloth. *Flowers* green, small.

SUBORDER III. URTICEÆ. NETTLE FAMILY proper.

Herbs (in our country) *with watery juice, and flowers in spikes, heads, or panicles.* STYLE single or none.

5. URTICA, Tourn. NETTLE.

Lat. *uro,* to burn; some of the species are armed with stinging hairs.

FLOWERS monœcious or diœcious; the STERILE mostly with 4 sepals, and 4 stamens: the FERTILE with 4 or 2 seperate sepals, and no rudimentary stamens. ACHENIUM oblong or ovate, flattish.—*Herbs with stinging hairs, stipulate leaves, and greenish flowers in axillary panicles, racemes, spikes, or heads.*

SEC. I. URTICA proper. *Sterile calyx* 4-parted; the *fertile* of 4 very unequal sepals, the 2 outer small, the inner foliaceous.—*Leaves opposite.*

1. U. GRACILES, Ait. *Slender Nettle.*

Sparingly bristly, tall and slender; *leaves* ovate-lanceolate, pointed, serrate, 3 to 5-nerved from the rounded or scarcely heart-shaped base, smoothish, on elongated bristly petioles; *flower-clusters* in slender and loosely panicled branched spikes.

Fencerows and moist ground, rather common. July. Per. Plant 2 to 6 feet high, with scarcely any stinging hairs except on the petioles and sparingly on the principal veins, not downy. *Flowers* minute, green.

2. U. DIOICA, L. *Diœcious* or *Stinging Nettle.*

Very bristly and stinging; *leaves* ovate, heart-shaped, pointed, very deeply serrate, downy underneath as well as the upper part of the stem; *flower-clusters* in panicled branched spikes.

Waste places, common; introduced. June—Aug. Per. *Stem* 2 to 4 feet high, branching, obtusely 4-angled, with opposite short-petioled leaves, 3 to 4 inches long, and about ½ as wide. *Flowers* small, green. Whole plant copiously beset with stinging bristles.—Like the last mono-diœcious.

3. U. URENS, L. *Small Stinging Nettle.*

Leaves elliptic or roundish-ovate, somewhat 5-nerved, acutely serrate, with spreading teeth; *flower-clusters* nearly simple, 2 in each axil, shorter than the petioles.

Cultivated grounds, rare; introduced from Europe. July. Ann. *Stem* 10 to 15 inches high, stinging. *Leaves* 1 to 2 inches long on slender petioles.

SEC. 2. LAPORTEA, Gaud. *Sterile calyx* 5-parted, the *fertile* of 2 equal sepals:—*Leaves alternate.*

4. U. CANADENSIS, L. *Canadian Nettle.*

Leaves ovate, obtusely serrate, pointed; *flowers* in long and loose divaricately-branched panicles, the lower sterile, the upper fertile.

Moist shady grounds, along streams. common. Aug. Per. *Stem* 3 to 6 feet high, branching, stout, erect. *Leaves* often 6 inches long, strongly feather-veined. This species has very tough and strong fibres, and was formealy proposed by Mr. Whitlow as a substitute for hemp.

6. BŒHMERIA, Jacq. False Nettle.

Named after *G. R. Bœhmer*, a German Botanist.

Flowers monœcious or diœcious, minute. Sterile flowers with 4 sepals, and 4 stamens. Fertile with a tubular or urn-shaped entire or 4-toothed calyx inclosing the ovary. Style awl-shaped, stigmatic down one side. Achenium elliptical, closely invested by the persistent calyx.—*Herbs or shrubs*, (nearly allied to Urtica) *with opposite or alternate leaves and clustered flowers in axillary spikes.*

B. cylindrica, Willd. *Common False Nettle.*

Smoothish; *stem* tall and simple; *leaves* mostly opposite, oblong-ovate or ovate-lanceolate, pointed, serrate, 3-nerved, on long petioles; *flowers* diœcious or sometimes intermixed, in clusters.

Moist thickets, common. June—Aug. Per. *Stem* 2 to 3 feet high, obtusely 4 angled. *Leaves* 2 to 4 inches long, ½ as wide. *Flowers* minute greenish, in slender mostly leafy spikes, the sterile interrupted, the fertile mostly uninterrupted.

7. PILEA, Lindl. Stinglesss Nettle.

Flowers monœcious; the two kinds often intermixed in the same panicle, bracted; the sterile of 3 to 4 sepals and stamens; the fertile with 3 more or less unequal sepals or divisions and an incurved scale before each. Stigma sessile, pencil-tufted. Achenium minutely warty.—*Smooth or hairy herbs, with opposite long petioled leaves; the flowers in axillary clusters.*

P. pumila, Lindl. *Richweed Clearweed.*

Low; *stems* smooth and shining, translucent; *leaves* ovate, coarsely toothed, pointed, 3-nerved, smoothish; *flower-clusters* much shorter than the petiole; *sepals* of the fertile flowers lanceolate, somewhat unequal.

Cool and moist shaded places, common. July—Sept. Ann. *Stem* 4 to 18 inches high, with smooth pellucid branches. *Flowers* very small, greenish.

8. PARIETARIA, Tourn. Pellitory.

Lat. *paries*, a wall; from the place where some of the species grow.

Flowers monœcious or polygamous, in clusters surrounded by a many-cleft involucrate bract. Calyx 4-parted: stamens 4, at first incurved, then expanding with an elastic force. Style terminal, short or none: stigma pencil-tufted.—*Small herbs, with usually alternate leaves, and green flowers in axillary clusters.*

P. PENNSYLVANICA, Muhl. *American Pellitory.*

Low, simple or sparingly branched, minutely downy; *leaves* oblong-lanceolate, very thin, veiny, roughish with opaque dots; *flowers* often perfect, shorter than the involucral leaves; *fertile calyx* bell-shaped, 4-cleft to the middle; *stigma* sessile.

Shaded rocky banks, rare. June—Aug. Ann. A small homely weed 6 to 12 inches high. *Leaves* alternate, hairy, 1½ to 2 inches long, ½ inch wide, on petioles. *Flowers* dense, greenish and reddish-white.

SUB-CLASS II. GYMNOSPERMOUS EXOGENS.

OVULES not enclosed in an ovary, fertilized by the pollen without the intervention of a pistil, and becoming truly *naked seeds*, the carpel being represented by a flat open scale or leaf, or entirely wanting. COTYLEDONS often more than two.

ORDER 110. CONIFERÆ.—*Pine Family.*

Trees or shrubs, with resinous juice, mostly with subulate or accrose entire leaves, and monœcious or diœcious flowers in aments destitute of calyx or corolla. OVULES orthotropous. EMBRYO in the axis of the albumen. (Wood destitute of ducts, composed chiefly of a homogeneous large woody fibre which is marked with circular disks on two sides.) Comprises the three following sub orders.

SUB-ORDER I. ABIETINEÆ. PROPER PINE FAMILY.

FERTILE FLOWERS in aments, consisting of open imbricated carpels in the form of scales subtended by a bract, in fruit forming a *strobile* or *cone.* OVULES 2, adherent to the base of each carpellary scale, with the orifice turned downward.

1. PINUS, Tourn. PINE.

The classical Latin name.

FLOWERS monœcious. STROBILE large, conical; CARPELLARY SCALES thickened at the summit, becoming strong and woody in fruit. COTYLEDONS 3 to 12, linear.—*Trees, often of the loftiest dimensions, with evergreen, needle-shaped leaves, in fascicles of 2 to 5 from the same slender buds, sheathed by the scarious bud scales at the base.* Flowering in May or June; the *cones* maturing the seeds in the autumn of the second year.

* *Leaves 2 or 3 in a sheath, rigid, scales of the cones thickened at the end, and mostly tipped with a point or spine; bark rough.*

1. P. INOPS, Ait. *Jersey or Scrub Pine.*

Leaves in pairs, rather short; *cones* oblong-conical, sometimes curved, the scales tipped with a prominent and straight awl-shaped prickle.

Barrens and sterile hills, common. A straggling tree 15 to 40 feet high, with spreading or drooping branchlets; young shoots with a purplish glaucous bloom. *Leaves* 1¾ to 2¾ inches long. *Cones* 2 to 3 inches long.

2. P. RIGIDA, Miller. *Pitch Pine.*

Leaves in threes (rarely in fours) from very short sheaths, flattish; *cones* ovoid-conical; the scales tipped with a short and stout recurved prickle.

Barren sandy or gravelly plains, common. A tree 30 to 70 feet high, with very rough and dark bark, and hard wood saturated with resin. *Leaves* rigid, 3 to 5 inches long, dark green. *Cones* usually clustered in 3s or 4s, 2 to 3 inches long.

3. P. RESINOSA, Ait. *Red Pine.*

Leaves in pairs, from long sheaths, semicylindrical, elongated; *cones* ovoid-conical; *scales* pointless, dilated in the middle. (P. rubra, *Michx.*)

Dry woods, banks of streams; northern parts of the State, Pine Creek, Lycoming Co., Canisteo, Tioga Co. A tree 50 to 80 feet high, with reddish and rather smooth bark, and compact wood, softer than that of P. rigida. *Leaves* dark green, 5 to 6 inches long. *Cones* about 3 inches long, sometimes aggregated in large and close clusters.

4. P. MITIS, Michx. *Yellow Pine.*

Leaves in pairs (rarely in 3), from long sheaths, channelled, slender; *cones* ovoid or oblong-conical; the *scales* slightly enlarged at the end, tipped with a minute and weak prickly point.

Dry gravelly or sandy soil, common. A tree 60 to 80 feet high, 18 to 36 inches thick, straight, producing a very durable, fine-grained, moderately resinous timber, valuable for flooring, &c. *Leaves* 3 to 5 inches long, softer than in any of the preceding, dark green. *Cones* 2 to 3 inches long.

5. P. MONTANA, N. *Pome Pine.*

Leaves in pairs, short, rigid, very acuminate; *cones* large, growing in clusters, sometimes on the trunk of the tree.

Mifflin, Centre and Union Counties. This somewhat doubtful species was first discovered by Mr. F. H. Miller, of New York, growing on the south slope of the seven mountains in Mifflin county from thence to the Natural Bridge west and south to Cumberland Co., Va. Since then I have found it on high sterile land in the western part of Union Co. The trunk is short, rarely exceeding 30 feet in height, with a rough bark and conical top. *Foliage* light green, very disagreeable to the touch. *Cones* very large, 4 to 6 inches long and 3 to 4 inches in diameter. This may prove to be the *Table-mountain Pine* of Michx.

* * *Leaves* 5 *in a sheath, soft and slender; scales of the cones pointless and not thickened at the end; bark smooth.*

6. P. STROBUS, L. *White Pine.*

Leaves in fives, very slender, rather glaucous, with deciduous sheaths; *cones* narrow, cylindrical, nodding, somewhat curved.

Cool and damp woods, common. The White Pine is one of the most majestic and most useful of forest trees. The trunk is straight, covered with a smoothish bark, and from 80 to 120 feet high, with a diameter of 2 to 4 feet, or more. *Leaves* about 4 inches long, bluish-green, forming a very soft and delicate foliage. *Cones* 4 to 6 inches long; the scales very slightly thickened upward.

2. ABIES, Tourn. SPRUCE. FIR.

The classical Latin name.

STERILE AMENTS scattered or somewhat clustered towards, the ends of the branchlets. SCALES of the strobiles thin and flat, not thickened at the apex, nor with a prickly point. SEEDS with a persistent wing.—*Handsome trees or shrubs, with evergreen, scattered, short, frequently 2 ranked leaves.*

SEC. I. *Cones* long, erect, lateral. *Bark* smooth, with blisters of balsam.—*Leaves flat, becoming 2-ranked, silvery-whitened underneath, obtuse or notched at the apex.*

1. A. BALSAMEA, Marsh. *Balsam Fir. Silver Fir.*

Leaves narrowly linear; *cones* cylindrical, large, violet-colored; *bracts* obovate, serrulate, tipped with an abrupt slender point, slightly projecting, appressed.

Cold damp woods and swamps; Muncy Creek, Lycoming Co. A beautiful evergreen, much cultivated for ornament. The branches are nearly horizontal, gradually becoming shorter upwards, forming a regular pyramidal head. *Leaves* ¾ to 1 inch long, growing upon the sides and top of the branches, of a bright green above and silvery-white beneath. *Cones* 3 to 4 inches long, 1 inch thick, the scales very broad and rounded.

2. A. FRASERI, Pursh. *Double Balsam Fir. Fraser's Fir.*

Leaves narrowly linear, often emarginate, glaucous beneath; *cones* small, oblong ovate; *bracts* oblong-cuneate, short-pointed, the upper part much projecting and reflexed. (A. balsamifera, Michx.)

Mountains. Lewis Lake, Pokona mountain, and Bear meadows, Centre Co. A highly ornamental tree, much resembling the "Norway Fir" in foliage. *Leaves* ½ to ¾ inch long, of a yellowish green color. *Cones* 1 to 2 inches long when mature, distinguished by the long-pointed, violet-colored, reflexed bracts. *Sterile aments* terminal.

SEC. II. *Cones* hanging, terminal; *sterile aments* scattered.—*Leaves evergreen.*

* *Leaves 2-ranked, flat, whitened underneath.*

3. A. CANADENSIS, Michx. *Hemlock Spruce.*

Leaves linear, flat, obtuse; *cones* oval, of few scales, somewhat longer than the leaves.

Hilly or rocky woods, and along mountain streams, common. A well known tree, 70 to 80 feet high, with a light spreading spray, and delicate foliage, bright above, silvery underneath. *Cones* ¾ inch long. The bark is extensively used in tanning.

* * *Leaves needle-shaped, 4-angular, equally distributed all around the branches.*

4. A. ALBA, Michx. *White Spruce. Single Spruce.*

Leaves slender, spreading, of a glaucous or light bluish-green hue; *scales* of the oblong cones entire.

Cold swamps and moist woods, rare; Bear Meadows, Centre Co. A tree 40 to 60 feet high, slender, with light-colored bark, slender and often drooping branchlets, and pale somewhat spreading leaves, ½ to ¾ inch long. *Cones* small, 1 to 1½ inch long, pale-brown.

5. A. NIGRA, Poir. *Black or Double Spruce.*

Leaves short, erect, rigid, very dark green; *cones* ovate with the scales wavy and toothed at the apex.

Swamps or mountain woods. A tree 40 to 70 feet high, with a straight trunk, and lofty pyramidal head. The *leaves* thickly cover the branches, about ½ inch long. *Cones* 1 to 2 inches long, reddish-brown.

3. LARIX, Tourn. LARCH.

The ancient name.

AMENTS lateral and scattered, bud-like. STERILE FLOW-

ERS nearly as in Pinus. CONES ovoid, erect, the bracts and scales persistent; otherwise as in Abies.—*Trees, with deciduous soft leaves, collected in fascicles of* 20 to 40, (developed in early spring) *and crimson or red fertile aments in flower.*

L. AMERICANA, Michx. *American Larch. Tamarack.*

Leaves nearly filiform, without sheaths; *cones* ovoid, composed of few rounded scales, inclining upwards; *bracts* elliptical, often hollowed on the side.

Swamps, not common. Black-Hole Valley, Lycoming Co. A beautiful tree, 30 to 70 feet high, often cultivated. *Leaves* 1 to 2 inches long, collected in bunches of 12 to 29 on the side of the branches. *Cones* deep purple, ½ to 1 inch long.

SUB-ORDER II. CUPRESSINEÆ. CYPRESS FAMILY.

FERTILE FLOWERS consisting of few carpellary scales, without bracts, bearing 1 to 8 erect ovules on their base, forming a closed strobile or drupe-like fruit.

4. THUJA, Tourn. ARBOR VITÆ.

Gr. *Thua, Thuoia,* the ancient name of some resinous evergreen,

FLOWERS monœcious on different branches, in very small terminal ovoid aments. ANTHERS 4, sessile. FERTILE AMENTS of few imbricated scales, fixed by the base, each bearing 2 erect ovules, dry and spreading at maturity. COTYLEDONS 2.—*Trees or shrubs, with evergreen squamose imbricated leaves.*

1. T. OCCIDENTALIS, L. *American Arbor Vitæ.*

Leaves ovate-rhombic, with a gland on the back, appressed-imbricated in 4 rows on the 2-edged branchlets; *scales* of the cones pointless, 1-seeded; *seeds* broadly winged.

Swamps and cool rocky banks, rare. A tree 20 to 30 feet high, with very tough and recurved branches. *Cones* about ½ inch long, yellowish-brown. The wood is very light, soft and durable.

The THUJA ORIENTALIS, *Chinese Arbor Vitæ* a beautiful evergreen shrub, with bright green foliage, is common in cultivation.

5. CUPRESSUS, Tourn. CYPRESS.

The classical name.

FLOWERS monœcious on different branches, in terminal small aments. STERILE AMENTS composed of shield-shaped scale-like filaments, bearing 4 anther-cells under the margin. FERTILE AMENTS globular, with scales in 4 ranks, bearing several erect ovules. CONE globular, firmly closed, but opening at maturity. SEEDS compressed, narrowly winged. COTYLEDONS 2 or 3.—*Strong-scented evergreen trees, with* *very small and scale-like closely appressed-imbricated leaves, and very durable wood.*

C. THYOIDES, L. *White Cedar.*

Leaves minute, ovate, with a small gland on the back, closely imbricated in 4 rows on the 2-edged branchlets; *cones* spherical.

Swamps, rare. May. A tree 30 to 70 feet high, with white, fine-grained and very light, soft and durable wood. *Cone* scarcely larger than a pea, few-seeded.

6. TAXODIUM, Richard. BALD CYPRESS.

Gr. *Taxas*, the Yew, and *oides*, resemblance.

FLOWERS monœcious on the same branches. STERILE AMENTS spike-panicled, of few stamens. FERTILE AMENTS ovoid, in small clusters, scaly, with 2 ovules at the base of each scale. CONE globular, closed, composed of very thick and angular somewhat shield-shaped scales, bearing 2 angled seeds at their base. COTYLEDONS 6 to 9.—*Trees with linear 2-ranked and deciduous leaves.*

T. DISTICHUM, Richard. *American Cypress.*

Leaves linear, strictly 2-ranked and spreading; sometimes awl-shaped and imbricated on the flowering branches; *sterile aments* paniculate, pendulous, leafless; *cone* oblong-globose.

Swamps, along the Delaware, rare. A large tree sometimes attaining the height of 100 feet or more, with a wide spread and often depressed head. *Foliage* light green and open. *Cones* 1 inch in diameter. The timber is light fine-grained and durable.

7. JUNIPERUS, Linn. JUNIPER.

The classical name.

FLOWERS diœcious, or sometimes monœcious, in very small lateral aments: ANTHERS 4 to 8, 1-celled. FERTILE AMENTS ovoid, of 3 to 6 fleshy, 1 to 3-ovuled scales; in fruit forming a sort of drupe or berry, scaly-bracted underneath. SEEDS 1 to 3, long. COTYLEDONS 2.—*Evergreen trees or shrubs, with awl-shaped or scale like rigid leaves.*

1. J. COMMUNIS, L. *Common Juniper.*

Leaves in threes, linear-awl-shaped, prickly-pointed, spreading, longer than the ovoid berry.

Dry woods and sterile hills. May. A shrub, with numerous prostrate spreading branches, spreading nearly flat on the ground, rarely ascending. *Leaves* in whorls of 3, ½ inch long, bright green except the glaucous-white concave upper surface. *Berries* dark-purple, as large as a pea.

2. J. VIRGINIANA, L. *Red Cedar.*

Leaves 4-ranked, much crowded, on young plants and rapidly-growing shoots awl-shaped and somewhat spreading in pairs or threes, on older lateral twigs very small and scale-like, closely imbricated, triangular-ovate.

Dry rocky hills, common, generally in limestone regions. April. A small tree, with numerous horizontal branches. *Berries* small, bluish, covered with a white powder. The wood is fine-grained and compact, of a reddish hue, very light and durable.

3. J. SABINA, L. *Savin.* A widely spreading or almost prostrate shrub, native of South Europe, is sometimes found in cultivation. (J. Virginiana, Var. humilis, Hook.)

SUB-ORDER III. TAXINEÆ. YEW FAMILY.

FERTILE FLOWERS solitary, consisting of a naked ovule, ripening into a drupe-like or nut-like fruit.

8. TAXUS, Tourn. YEW.

The classical name.

FLOWERS mostly diœcious, axillary from scaly buds. STAMENS 8 to 10, monodelphous; ANTHERS peltate, 6 to 8-celled. FERTILE FLOWERS solitary, scaly-bracted at the base, consisting of a single ovule, becoming in fruit a fleshy 1-seeded drupe. COTYLEDONS 2.—*Trees or shrubs, with evergreen, flat mucronate, rigid, scattered 2-ranked leaves.*

T. CANADENSIS, Willd. *American Yew.*

Stems diffusely spreading; *leaves* linear, with slightly revolute margins; *sterile receptacle* globose.

Moist shaded banks and hills, near streams. April. A small evergreen stragling or prostrate bush, with the general aspect of a dwarf hemlock spruce. *Leaves* nearly an inch long, green on both sides, arranged in 2 opposite rows on the sides of the branchlets. *Drupes* oval, concave or open at the summit, red and juicy when mature.

CLASS II.

ENDOGENS OR MONOCOTYLEDONS.

STEMS with no manifest distinction into bark, wood, and pith; but the woody fibre and vessels collected into bundles or threads which are irregularly imbedded in the cellular tissue: perennial trunks destitute of annual layers, increasing by internal accretions. LEAVES mostly parallel-veined (nerved) and sheathing at the base, seldom seperating by an articulation, alternate, entire. FLOWERS commonly in threes. EMBRYO with a single cotyledons (or if two they are alternate).

SUB-CLASS III. AGLUMACEOUS ENDOGENS.

Plants of the endogenous structure, with flowers constructed on the usual plan; perianth verticillate, consisting of one or more whorls of petaloid organs, or wanting.

ORDER 111. **ARACEÆ.**—*Arum Family.*

Plants with acrid or pungent juice, simple or compound often veiny leaves, and monœcious or perfect flowers crowded on a spadix, which is usually surrounded by a spathe. FLORAL envelopes none, or of 4 to 6 sepals. FRUIT usually a berry.

1. ARUM, Linn. INDIAN TURNIP.

The ancient name, of unknown meaning.

FLOWERS monœcious, the upper sterile and the lower fertile, or sometimes polygamous diœcious, on the base of an elongated spadix, surrounded by a hooded spathe, convolute at base. PERIANTH none. ANTHERS crowded and somewhat whorled on the spadix, nearly sessile. BERRY 1-celled, many-seeded.—*Low perennial herbs, with a tuberous rootstock or corm, sending up a simple scape, sheathed with the petioles of the simple or compound veiny leaves.*

1. A. TRIPHYLLUM, L. *Indian Turnip. Jack-in-the-Pulpit.* *Leaves* mostly 2, divided into 3 elliptical-ovate pointed leaflets; *spadix* club-shaped, obtuse, much shorter than the spathe; *spathe* ovate, acuminate, flat and deflected above.

Rich moist woods, common. May. *Corm* turnip-shaped, wrinkled, with an intensely acrid juice. *Leaves* 2 to 7 inches long, ½ as wide, smooth. *Spathe* with the petioles and sheaths green, or frequently variegated with dark and whitish stripes or spots. *Berries* bright scarlet, in a dense head, ripe in autumn.

2. A. DRACONTIUM, L. *Green Dragon. Dragon-root.*

Leaf mostly solitary, pedately divided into 7 to 11 oblong-lanceolate pointed leaflets; *spadix* tapering to a long and slender point, beyond the oblong and pointed spathe.

Low grounds, along streams, common. May. *Corms* clustered. *Leaf* large and spreading, on a petiole 1 to 2 feet long, extending much beyond the peduncle. *Spathe* greenish, rolled in a tube, with a short erect point. *Berries* scarlet.

2. PELTANDRA, Raf. ARROW ARUM.

Gr. *pelta*, a shield or target, and *andres*, stamens; from the shield-shaped stamens.

FLOWERS monœcious, thickly covering the long and tapering spadix throughout; the staminate above, and the pistillate below. SPATHE convolute throughout, elongated. PERIANTH none. STAMENS peltate. BERRY 1-celled, 1-seeded.—*A stemless perennial herb, with arrow-shaped leaves and simple scapes from the root of thick tufted fibres.*

P. VIRGINICA, Raf. *Arrow-leaved Arum.*

Acaulescent; *leaves* oblong, hastate-cordate, acute at the apex, the lobes obtuse; *spathe* elongated, incurved; *spadix* covered with flowers nearly the whole length (Arum Virginicum, *L.* Lecontia, *Torr.*)

Swampy borders of ponds and streams, common. June. A smooth dark green plant, with scapes 8 to 15 inches high. *Leaves* radical, numerous, 8 to 12 inches long, ½ as wide, on petioles 8 to 12 inches long. *Berries* 1 to 3-seeded, green when ripe.

3. CALLA, Linn. WATER ARUM.

An ancient name, of unknown meaning.

SPATHE spreading, ovate, persistent. SPADIX oblong, entirely covered with flowers, the lower perfect, the upper often staminate only; destitute of a perianth. ANTHERS with slender filaments. STIGMA sessile. BERRIES distinct, few-seeded.—*Perennial aquatic herbs, with a creeping thickish rootstock, bearing heart shaped long-petioled leaves, and solitary scapes.*

C. PALUSTRIS, L. *Northern Calla. Common Water Arum.*

Leaves cordate; *spathe* ovate, flat; *spadix* covered with ovaries, intermixed with stamens.

Bogs and shallow waters, rare. June. A fine plant. *Leaves* 2 to 3 inches long, ¾ as wide, on long petioles, with an involute acuminate point. *Scape* 6 to 8 inches high, roundish, smooth. *Spathe* clasping at the base, greenish-yellow, white and soft within. *Spadix* 1 inch long.

The C. ÆTHIOPICA, (Ethiopian Calla) A beautiful plant from Cape Good Hope is often met with in green houses and parlors.

4. SYMPLOCARPUS. Salisb. SKUNK CABBAGE.

Gr. *symploko*, connection, and *karpos*, fruit; the berries being united.

SPATHE hooded-shell-form, pointed, fleshy. SPADIX oblong, entirely covered with perfect flowers. PERIANTH deeply 4-parted, persistent. STAMENS 4, opposite the perianth lobes, with short filaments. STYLE 4-angled, with a minute stigma. SEEDS berry-like, imbedded in the enlarged and spongy spadix.—*Perennial herbs, pervaded with a strong odor, with a thick descending rootstock bearing coarse fibrous roots, and a cluster of very large and entire veiny leaves, preceded by the nearly sessile spathes.*

S. FŒTIDUS, Salisb. *Common Skunk Cabbage.*

Leaves ovate, heart-shaped, short-petioled; *spadix* globular, much shorter than the spathe. (Ictodes, Bigl.)

Moist grounds, common. March, April. *Leaves* 1 to 2 feet long, smooth. *Spathe* spotted and striped with purple and yellowish-green, ovate, incurved. *Fruit* ripe in Sept., forming a rough and globular mass, 2 to 3 inches in diameter, in decay shedding the bulblet-like seeds. Medicinal.

5. ORONTIUM, Linn. GOLDEN-CLUB.

An ancient name, of obscure origin.

SPATHE none. FLOWERS crowded all over a cylindrical spadix, perfect; the lower with a 6-parted perianth and 6 stamens, the upper with 4. OVARY free, 1-celled; STIGMA sessile, minute. FRUIT a green utricle or dry berry.—*An aquatic perennial, with a deep rootstock, long-petioled and entire nerved floating leaves, and the spadix terminating the scapes which thicken upwards, covered with yellow flowers.*

O. AQUATICUM, L. *Common Golden-club.*

Leaves ovate-lanceolate; *spike* or *spadix* cylindric on a club-shaped scape.

Ponds and marshes. May. *Leaves* 6 to 10 inches long, ½ to ⅔ as wide, smooth, of a deep green, velvet-like above, paler beneath. *Scape* 8 to 15 inches long, ending in a spadix of a rich yellow color, covered with small perfect yellow flowers.

6. ACORUS, Linn. CALAMUS.

Gr. *a*, privative, and *kore*, the pupil of the eye; a supposed remedy for sore eyes.

SPADIX lateral, sessile, emerging from the side of a scape which resembles the leaves, densely covered with flowers. PERIANTH 6-sepaled. STAMENS 6. OVARY 1, free: STIGMA minute, sessile. FRUIT at length dry, 1-few-seeded.—*Pungent aromatic plants, especially the thick creeping rootstocks, which send up ensiform leaves, and foliaceous scapes bearing the spadix on one edge.*

A. CALAMUS, L. *Sweet Flag. Common Calamus.*

Scape prolonged and leaf-like far beyond the cylindrical spadix.

Margins of streams and wet medows, not rare. June. *Rhizoma* horizontal, aromatic. *Leaves* sword-shaped, 2 to 3 feet long, and ½ to ¾ inch wide. *Spadix* 2 to 3 inches long, sessile on the side of the scape, covered with minute greenish flowers.

ORDER 112. **LEMNACEÆ.**—*Duckweed Family.*

Minute stemless plants, floating free on the water, destitute of distinct stem and foliage, but a flat frond, producing one or two monœcious flowers from a chink at the edge or upper surface, and usually hanging roots from underneath. FRUCTIFICATION much as in Araceæ, of which these plants appear to be minute and greatly reduced forms.

LEMNA, Linn. DUCKWEED.

The Greek name of uncertain meaning.

FLOWERS 2 to 3, appearing from the margin of a flat frond, enclosed in a spathe, monœcious: the sterile consisting of 1 to 2 stamens with long filaments; the fertile of a 1-celled ovary, a short style and a simple stigma. FRUIT a utricle.—*Floating annuals, consisting of a stem and leaf confounded* (frond) *sending down from the under surface, roots which hang loosely in the water, and producing the spathaceous flowers from the margins, which are seldom found.*

1. L. MINOR, L. *Lesser Duckweed.*

Fronds roundish-obovate, thickish, often grouped; *root* solitary; *ovule* solitary; *seed* horizontal.

Stagnant water, very common; but not yet found in flower in this country. *Fronds* ⅛ inch long, somewhat fleshy, increasing rapidly by *gemmæ* (young fronds) so as often completely to cover the surface of the water.

2. L. TRISULCA, L. *Star Duckweed.*

Fronds oblong-lanceolate, from a stalked base, thin, denticulate at the tip, proliferous from the sides near the middle so as to form crosses; *flowers* very minute; *ovule* solitary, half anatropous.

Ditches and ponds; rarely in flower. *Fronds* ½ inch or more long.

3. L. POLYRHIZA, L. *Larger Duckweed.*

Fronds roundish-ovate, thickish, flat above, palmately veined, (¼ to ½ inch long) often dark purple beneath; *root* a bundle of 8 to 10 simple fibres in the middle of the frond.

Stagnant waters, rare. It is said never to have been seen in flower in this country.

ORDER 113. **TYPHACEÆ.**—*Cat-tail Family.*

Marsh herbs, with nerved and linear sessile leaves, and monœcious flowers on a spadix or in heads, destitute of proper floral envelopes. OVARY tapering into a slender style, and usually an elongated tongue-shaped 1-sided stigma. FRUIT nut-like when ripe, 1-seeded. SEED suspended, anatropous.

1. TYPHA, Tourn. CAT-TAIL FLAG.

Gr. *typhos*, a marsh; alluding to the place of its growth.

FLOWERS in long and very dense cylindrical spikes, terminating the stem; the upper part consisting of stamens, intermixed with simple hairs; the lower or fertile part consisting of ovaries, surrounded by club-shaped bristles, which form the copious down of the fruit. NUTLETS minute, very long-stalked.—*Marsh herbs, with perennial roots, very deciduous spathes or bracts, and narrow leaves sheathing the base of the erect thickish jointless stems.*

1. T. LATIFOLIA, L. *Common Cat-tail. Reed-mace.*

Leaves linear, nearly flat; *sterile* and *fertile* spikes close together or continuous.

Borders of ponds. July. *Stem* 3 to 5 feet high, round and smooth, leafy below, terminated by the large cylindric spike, which is 6 to 10 inches long, 1 inch thick, brownish at the surface.

2. T. ANGUSTIFOLIA, L. *Narrow-leaved Cat-tail.*

Leaves channelled towards the base, narrowly linear; *sterile* and *fertile* spikes a little remote.

Muddy pools and ditches, rare. July. *Stems* and *spikes* more slender, and the leaves narrower than in the last.

2. SPARGANIUM, Tourn. BURR-REED.

Gr. *sparganon*, a fillet, from the ribbon-like leaves.

FLOWERS collected in seperate dense globose heads, scattered along the summit of the stem, subtended by leaf-like bracts, the *upper ones* sterile, consisting merely of stamens with minute scales irregularly interposed; the *lower* or *fertile* larger, consisting of numerous sessile pistils, each surrounded by 3 to 6 scales much like a calyx. FRUIT nutlike when mature, 1 to 2-celled.—*Aquatic herbs, with fibrous perennial roots, simple or branching stems, sheathed by the base of the linear leaves.*

1. S. RAMOSUM, Hudson. *Great Burr-reed.*

Stem erect, branching above; *leaves* triangular at base, the sides concave; *scales* of the fertile flowers thickened and dilated above; *stigma* linear, longer than the style.

Borders of ponds and ditches, common. July, Aug. *Stem* 2 feet high, round. *Leaves* 1 to 2 feet long, ⅓ to ½ inch wide, thickish. *Heads of flowers* light green; fertile ones 2 to 5, the lowest generally somewhat stalked, sterile ones above, more numerous, smaller, sessile. *Stigmas* often 2.

2. S. AMERICANA, Nutt. *American Burr-reed.*

Stem erect, mostly simple; *leaves* triangular at the base, the sides flat; *stigma* conical, oblong, oblique, about ½ as long as the slender style.

Small streams and ponds, common. Aug. *Stem* 1 to 2 feet high, simple or divided at base. *Leaves* mostly radical, 1 to 2½ feet long, ¼ inch wide, keeled at base. *Fertile heads* sessile, mostly 3, below the several barren ones, with the simple styles conspicuous.

3. S. NATANS, L. *Floating Burr-reed.*

Stem weak; *leaves* flat, thin, often floating; *heads* few, the *sterile* 1 to 2; *stigma* oblong, shorter than the style.

Ponds and streams, common. Aug. *Stem* long and slender, and with the leaves floating. *Leaves* when floating, elongated, narrow, and pellucid.

ORDER 114. **NAIADACEÆ.**—*Pondweed Family.*

Immersed aquatic plants, with jointed stems and sheathing stipules within the petioles, or sessile sheathing bases, inconspicuous mono-diœcious flowers, which are naked or with a free merely scale-like calyx. STAMENS definite. OVARIES 1, or 2 to 4, free, 1-ovuled. STIGMA simple, often sessile. FLOWERS usually bursting from a spathe. FRUIT dry, indehiscent, 1-celled, 1-seeded.

1. NAIAS, Linn. NAIAD.

Gr. *Naias*, water-nymph; from the habitat.

FLOWERS diœcious, or sometimes monœcious, axillary, solitary and sessile. FERTILE FLOWERS consisting of a single ovary tapering into a short style; STIGMAS 2 to 4, awl-shaped. STAMENS 1, with a slender filament. FRUIT a little seed-like nutlet, enclosed in a loose epicarp.—*Slender branching herbs, growing entirely under water, with opposite and whorled crowed linear leaves, sessile and dilated at the base, and very small flowers, solitary, but often clustered with the branch-leaves in the axils.*

1. N. FLEXILIS, Rostk. *Bending Water Nymph.*

Leaves membranaceous, spreading, narrowly linear, very minutely denticulate, opposite or in 3s, 4s or 6s at the joints; *stigmas* usually 3 to 4. (N. Canadensis, *Michx.* Caulinia, *Willd.*)

Ponds and slow streams, common. July—Sept. *Stem* 6 to 20 inches long, many times forked. *Leaves* ½ to 1 inch long, less than 1 line wide. *Flowers* very small, sessile.

2. N. MINOR, L. *Smaller Water Nymph.*

Leaves alternate or opposite, linear-subulate, recurved, prickly-toothed, rigid.

In water, not common. Aug. *Stem* long, submersed, rather rigid. *Flowers* small.

2. ZANNICHELLIA, Mitchell. HORNED PONDWEED.

In honor of *Zannichelli*, a Venitian botanist.

FLOWERS monœcious, sessile, naked, usually both kinds from the same axil; the *sterile* consisting of a single stamen, with a slender filament; the *fertile* of 2 to 5 (mostly 4) sessile pistils in a cup-shaped involucre. STIGMA large and peltate. FRUIT a nutlet, on a short stipe, beaked with a short style.—*Slender branching herbs, growing entirely under water, with very slender stems opposite or alternate long and linear thread-form entire leaves, and sheathing membraneous stipules.*

Z. PALUSTRIS, L. *Common Horned Pondweed.*

Stem filiform, floating; *style* half as long as the fruit, which is flattish, somewhat incurved, even, more or less toothed on the back, nearly sessile.

Ponds and slow streams. July, Aug. *Stem* 1 to 2 feet long, round, smooth. *Leaves* grass-like, 2 to 3 inches long, sessile. *Flowers* issuing from axillary bracts, small, 2 together, a sterile and fertile.

3. POTOMAGETON, Tourn. PONDWEED.

Gr. *potomos*, a river, and *geiton*, near.

FLOWERS perfect, spiked. PERIANTH single, 4-leaved. STAMENS 4, nearly sessile, opposite the perianth lobes. OVARIES 4, pedicellate: STIGMA sessile or nearly so. FRUIT 4 sessile nutlets or drupes, flattened on one or two sides. SEEDS hook-shaped.—*Mostly perennial aquatic and submersed herbs, with creeping and rooting stems, two-ranked pellucid leaves, united membraneous sheathing stipules, and small greenish flowers* 3 *to* 10, *in a pedunculate spike, rising above the water.*

* *Leaves of two forms, the upper floating.*

1. P. NATANS, S. *Broad-leaved Pondweed.*

Leaves all long-petioled, the floating ones coriaceous, oval, elliptical, or ovate, chiefly rounded or a little heart-shaped at the base, many-nerved; *immersed ones* linear or lanceolate; *spikes* rather dense, shorter than the peduncles; *fruit* short-pointed, more or less keeled on the back.

Ponds and slow waters, common in the Susquehanna. July, Aug. *Stem* slender, 1 to 3 feet long, branched. *Spike* 1 to 2 inches long, 20 to 40-flowered. Varies with the lower leaves all reduced to petioles.

2. P. OBLONGUS, Viv., Fries. *Oblong-leaved Pondweed.*

Leaves oblong-elliptical; *nutlets* small, obtuse and pointless, always rounded at the back.

Pools and ditches. *Floating leaves* oblong-elliptical or oblong-lanceolate. *Fruit* rounded, not half as large as in P. natans.

3. P. HETEROPHYLLUS, Schreb. *Various-leaved Pondweed.*

Floating leaves elliptical or oblong, or the lowest lance-spatulate, on long petioles; *immersed leaves* lanceolate or linear, sometimes elongated and grass-like, flaccid, obscurely denticulate or roughish on the margins, the lower sessile; *peduncles* much thicker than the stem, elongated; *spike* cylindric, many-flowered.

Pools and shallow slow streams, common. Aug. *Stems* numerous, branched, filiform. *Floating leaves* 1 inch long, very variable. *Peduncle* 1 to 2 inches long. *Nutlets* roundish, flattened on the sides, obtuse and rigid on the back.

4. P. HYBRIDUS, Michx. *Hybrid Pondweed.*

Floating leaves oval or lance-oblong, 5 to 7-nerved, on petioles; *immersed leaves* capillary; *spike* globular, few-flowered, on a short somewhat club-shaped peduncle.

Shallow pools and streams. Aug. A delicate species, with thread-like branching stems 1 foot or more in length, and the *floating leaves* ½ to ¾ inch long, sometimes none. *Fruit* nearly round, flattened on the sides, somewhat keeled and crested on the back.

** *Leaves all submersed, uniform.*

5. P. LUCENS, L. *Shining Pondweed.*

Leaves oval-lanceolate, flat, large, the short petioles continuing in a thick midrib small pointed ; *peduncles* thickened upwards; *spikes* cylindrical, many-flowered; *nutlets* slightly keeled.

Ponds and deep streams. June. *Stem* long, branched. *Leaves* large, very pellucid, and when dry shining above, beautifully veined, 3 to 5 inches long, ½ to 1 inch wide, acuminate, each with a lanceolate bract above the base. *Spike* 2 inches long, of numerous green flowers.

6. P. PERFOLIATUS, L. *Perfoliate Pondweed.*

Leaves clasping by a heart-shaped base, ovate or ovate-lanceolate, sometimes round ovate, obtuse; *spikes* terminal, with a few alternate flowers; *nutlets* rounded on the back, short-pointed.

Ponds and rivers, common. July. *Stem* 2-forked, very leafy, 6 to 10 inches long. *Leaves* shining, 1 to 1½ inch long, ⅓ as wide, obtuse, flat, more or less wavy or crisped. *Spike* on a peduncle, 1 to 2 inches long.

7. P. PAUCIFLORUS, Pursh. *Grassy Pondweed.*

Stem very slender, and filiform, flattish; *leaves* narrowly linear, acutish; *spikes* few-flowered, short-peduncled; *nutlets* obliquely lenticular, distinctly crested on the back.

Ponds and streams, common. July, Aug. *Leaves* numerous 2 to 4 inches long, scarcely 1 line wide, obscurely 3-nerved, of a bright green color. *Flowers* 3 to 5, greenish, on a terminal peduncle an inch long.

8. P. PECTINATUS, L. *Fennel-leaved Pondweed.*

Stems thread-like, many-times forked; *leaves* bristle-form, 1-nerved; *spikes* interrupted, on long peduncles; *nutlets* rounded-obovate.

Ponds and deep streams. June. *Plant* much branched and leafy. *Leaves* 3 to 6 inches long, less than 1 line wide, thickish. *Spike* in clusters of 3 or 4 seperated in fruit by considerable intervals. *Fruit* purplish.

* * * *Stipules none; leaves all opposite and immersed.*

9. P. DENSUS, L. *Dense Pondweed.*

Leaves pellucid, elliptical or lanceolate, clasping; *spike* few-flowered, short-peduncled, reflexed in fruit; *nutlets* beaked and keeled. Bethlehem, Schwenitz.

ORDER 115. **ALISMACEÆ.**—*Water-Plantain Family.*

Marshy herbs, with parallel-veined leaves sheathing at the base, scape-like flowering stems, and perfect or monœcious flowers, not on a spadix, furnished with both calyx and corolla; sepals and petals each 3, *distinct.* STAMENS definite or indefinite. OVARIES 3 to-many, distinct or partly so. STYLES and STIGMAS as many as the ovaries. FRUIT dry, indehiscent, 1 to 2-seeded.

SUB-ORDER I. JUNCAGINEÆ. ARROW-GRASS FAMILY.

CALYX and COROLLA colored alike (greenish). SEED anatropous, with a straight embryo.—*Leaves petiole-like without a blade.*

1. TRIGLOCHIN, Linn. ARROW-GRASS.

Gr. *treis*, three, and *glochin*, a point; in allusion to the points of the capsule.

SEPALS and PETALS nearly alike, ovate, concave, deciduous.

STAMENS 6, with oval anthers, on short filaments. PISTILS united into a 3 to 6-celled compound ovary; STIGMAS sessile: OVULES solitary. CAPSULE splitting when mature into 3 to 6 carpels, which seperate from a central axis.—*Herbaceous aquatic or marsh plants, with ensiform rush-like leaves, sheathing the base of the slender and jointless scape, and small greenish flowers in a spiked raceme, bractless.*

T. MARATIMUM, L. *Sea-side Arrow-grass.*

Scape and *leaves* fleshy, thickish; *fruit* ovate, acutish, of 6 united carpels which are rounded at the base and slightly grooved on the back.

Salt marshes, rare. July. *Scape* 18 inches high, from a horizontal rootstock. *Leaves* linear, smooth, thick, 6 to 12 inches long, less than a line wide. *Flowers* greenish, 30 to 40 on the obtusely angled scape.

2. SCHEUCHZERIA, Linn.

In honor of the two brothers *Scheuchzers*, Swiss botanists.

SEPALS and PETALS 6, oblong, acute, persistent, spreading. STAMENS 6, with linear anthers. OVARIES 4, globular, slightly united at base, with flat sessile stigmas, 2 to 3-ovuled, in fruit forming 3 diverging and inflated capsules, 1 to 2 seeded, opening along the sides.—*A low perennial bog-herb, with a creeping jointed rootstock, tapering into the ascending simple stem, which is partly sheathed by the grass-like leaves. terminated by a loose raceme of a few flowers with sheathing bracts.*

S. PALUSTRIS, L. *Marsh Scheuchzeria.*

Peat bogs, rare. July. A rush-like plant, 8 to 12 inches high, angular. *Leaves* 4 to 6 inches long, semi-cylindric. *Flowers* yellowish-green, on short pedicels, each axillary to a bract.

SUB-ORDER II. ALISMEÆ.

CALYX green and persistent. COROLLA white, deciduous. SEED campylotropous.—*Leaves commonly furnished with a blade.*

3. ALISMA, Linn. WATER-PLANTAIN.

Gr. *alysmos*, anxiety, from the supposed remedial properties.

FLOWERS perfect. PETALS and SEPALS 3. STAMENS 6. OVARIES and STYLES numerous, in a simple circle on a flattened receptacle, forming coriacious achenia in fruit.—*Aquatic perennials, with radical several-ribbed leaves, and the scape with whorled panicled branches, bearing small white or pale rose-colored flowers.*

A. PLANTAGO, L. *Common Water-Plantain.*

Leaves ovate, oblong, or lanceolate, narrowed rounded or somewhat cordate at the base, 3 to 9-nerved, on long petioles; *panicle* loose, compound, many-flowered.

Ditches and marshy places, common. July, Aug. *Scape* 1 to 2 feet high. *Leaves* 4 to 6 inches long, ⅔ as wide.

4. SAGITTARIA, Linn. ARROW-HEAD.

Lat. *sagitta*, an arrow; from the peculiar form of the leaf.

FLOWERS monœcious, rarely diœcious or perfect. PETALS 3. SEPALS numerous (about 14). OVARIES many, collected in a spherical head on a globular receptacle, in fruit forming membranaceous achenia, covered with the persistent style.—*Marsh or aquatic herbs, with milky juice and fibrous roots, radical, mostly sagittate leaves sheathing at the base the scapes, which bear the white or whitish flowers in* 3s.

SEC. I. SAGITTARIA, proper. *Flowers* monœcious, rarely diœcious.

1. S. VARIABILIS, Engelm. MSS. Gray. *Common Arrow-head. Variable Arrow-head.*

Leaves triangular-arrow-shaped, or entire, oblong, lanceolate, linear, and sometimes mere naked petioles; *scapes* simple.

Ditches, pools, streams, and moist grounds, common. July, Aug. *Petals* white. "This with its Protean varieties of which almost every pool and stream furnishes a goodly number, embraces many nominal species of authors, and may safely be held to include all that are found within our limits," Gray. The largest forms bear sagittate leaves 12 inches or more long and 7 wide, others have both the main blade and the lobes linear, many bear entire leaves, or else mere naked petioles; the smallest forms being only from 3 to 5 inches high.

SEC. II. ECHINODORUS, Richard, Engelmann, in Gray. *Flowers* perfect. *Stamens* 7 to 21.

2. S. PUSILLA, Nutt. *Dwarf Arrow-head.*

Leaves linear, obtuse and short, with foliacious summits; *scape* simple, about as long as the leaves, umbellately 3 to 8 flowered, some of them becoming proliferous runners; *pedicels* elongated, recurved; *petals* inversely heart-shaped; *stamens* about 9; *styles* much shorter than the ovaries.

Muddy margins of ponds and streams. Aug. *Scape* 2 to 4 inches high. *Leaves* rarely ever subulate 1 to 2 inches long, scarcely a line wide. *Flowers* 3 to 6, each ripening 8 to 15 carpels.

ORDER 116. HYDROCHARIDACEÆ.—*Frog's-bit Family.*

Aquatic herbs, with diœcious or polygamous regular flowers on scape-like peduncles from a spathe, and simple or double floral envelopes, which in the fertile flowers are united into a tube and coherent with the 1 *to* 6*-celled ovary.* STAMENS 3 to 12, distinct, or monadelphous: ANTHERS 2-celled. STIGMAS 3 to 6. FRUIT ripening under water, indehiscent, many-seeded.

1. UDORA, Nutt. WATER-WEED.

Gr. *udor*, water; in allusion to its place of growth.

Polygamous. FLOWERS solitary and sessile, from a sessile and tubular 2-cleft axillary spathe. STERILE FLOWERS minute, with a 6-parted perianth; ANTHERS 9, oval, nearly sessile. FERTILE FLOWERS with 3 to 6 oblong anthers, and the perianth extended into an extremely long and capillary tube, the small lobes obovate, spreading. STYLE long and filiform: STIGMAS 3, large and spreading, 2-lobed. OVARY 3-celled, with 3 projecting pointed placentæ, each bearing a few orthotropous ovules. FRUIT oblong, coriaceous, few-seeded.—*A perennial herb, growing under water, with long branching stems, thickly beset with pellucid and veinless, 1-nerved sessile, whorled or opposite leaves, and very small whitish sessile flowers.*

U. CANADENSIS, Nutt. *Ditch Moss. Water-weed.*

Leaves oblong-ovate or lanceolate, finely serrulate, in 3s and 4s; *perianth tube* filiform. (Elodea Canadensis, *Michx.* Serpicula verticillata, *Muhl.*)

Ponds and slow streams. July. *Stem* submersed diffusely 2-forked, filiform. *Leaves* ¼ to ½ inch long, less than 1 line wide, thin. *Flowers* minute, of a dingy white, the slender hair-like tube 2 to 3 inches long. The staminate flowers break off, and float on the surface, where they expand and shed their pollen to fertilize the stigmas, which are raised to the surface by the excessively prolonged calyx-tube.

2. VALLISNERIA, Micheli. TAPE-GRASS.

In honor of *Antonia Vallisneri*, an early Italian botanist.

Diœcious. STERILE FLOWERS numerous, crowded in a head on a conical receptacle, inclosed in an ovate at length 3-valved spathe, which is borne on a very short scape: PERIANTH 2-parted: STAMENS mostly 3. FERTILE FLOWERS solitary and sessile in a tubular spathe which is borne on a very long scape: PERIANTH elongated, 6-parted; the alternate segments linear; *tube* linear, coherent with the 1-celled ovary: STIGMAS 3, large, 2-lobed. OVULES very numerous on 3 parietal placentæ. FRUIT elongated, cylindric, berry-like, 1-celled, many-seeded.—*Stemless plants, with long and linear grass-like leaves, growing entirely under water, and spiral scapes.*

U. SPIRALIS, L. *Eel-grass. Tape-grass.*

Leaves linear, thin, long and ribbon-like, obscurely serrulate, obtuse, somewhat nerved and netted-veined.

Slow waters, common. Aug. Per. *Leaves* all radical 1 to 2 feet long, ¼ inch wide, grass-like, smooth and deep-green. *Perianth* reddish-white. The staminate clusters of flowers break away from the bottom, as in Udora, and float on the surface, where they expand and shed their pollen around the fertile flowers, which are raised to the surface at this time; fertilization being thus accomplished, the filiform scapes which are 2 to 4 feet long, coil spirally and draw the ovary under water to ripen.

ORDER 117. **ORCHIDACEÆ.**—*Orchis Family.*

Perennial often acaulescent herbs, with fleshy corms, or tuberous fasciculated roots, simple, parallel-veined entire leaves, and irregular 6-merous flowers; the perianth adherent to the 1-celled ovary with 3 parietal placentæ, gynandrous stamens, and pollen cohering in waxy or mealy masses. PERIANTH SEGMENTS in 2 rows, the outer (*calyx*) usually colored and petaloid like the inner, the lowest one (*lip*) different from the others and often spurred. STAMENS 3, united with the style and thus forming the *column*, on which the 2-celled anther is variously situated.

1. MICROSTYLUS, Nutt. ADDER'S-MOUTH.

Gr. *mikros*, little, and *stylos*, a diminitive column or *style*.

SEPALS spreading. PETALS filiform or linear, spreading. LIP auricled or halbert-shaped at the base, entire or nearly so. COLUMN very small, with 2 teeth or wings at the summit. POLLEN MASSES 4, collateral, cohering by pairs at the apex.—*Small herbs, arising from solid bulbs, producing simple stems or scapes, which bear* 1 *or* 2 *leaves, and a raceme of minute greenish flowers.*

M. OPHIOGLOSSOIDES, Nutt. *Common Adder's-mouth.*

Leaf solitary near the middle of the stem, ovate, clasping; *raceme* short and obtuse; *pedicels* much longer than the flowers; *lip* obtusely auricled at the base, 3-toothed at the summit.

Damp woods, rare. July. *Stem* 4 to 10 inches high, 5-angled, with a single leaf about 2½ inches long and 1 inch wide. *Flowers* whitish, minute, numerous, in a terminal raceme an inch or more in length.

2. LIPARIS, Richard. TWAYBLADE.

Gr. *liparos*, fat or shining; in allusion to the smooth leaves.

SEPALS and PETALS nearly equal, linear, or the petals filiform, spreading. LIP flat, entire often bearing 2 tubercles above the base. COLUMN elongated, incurved. POLLEN MASSES 4, collateral.—*Small perennial herbs, arising from solid bulbs, with* 2 *root-leaves and a low scape, bearing a raceme of few purplish or greenish flowers.*

1. L. LILIIFOLIA, Richard. *Lily-leaved Twayblade.*

Leaves 2, ovate, shorter than the scape; *petals* filiform, reflexed; *lip* large, wedge-obovate, abruptly short-pointed. (Malaxis liliifolia, *Willd.*)

Moist woodlands. June. *Scape* 6 to 8 inches high, triangular. *Leaves* radical, 3 to 6 inches long, ⅓ to ¼ as wide, tapering into a sheathing base. *Flowers* rather large, 10 to 20 in a terminal raceme; the 3 sepals greenish-white, 2 upper petals, yellowish-white, and the large lip white.

2. L. LŒSELII, Richard. *Smaller Twayblade.*

Leaves 2, elliptical-lanceolate or oblong, sharply keeled; *scape* angular; *lip* obovate or ovate, entire. (Malaxis Correana, *Bart.*)

Bogs and wet meadows, rare. June, July. *Scape* 5 to 8 inches high, 3 to 5-angled.

Leaves 2 to 3 inches long, 1 inch wide, sheathing at base. *Flowers* small, erect, about 4, appressed to the rachis in a thin raceme, greenish-white.

3. CORALLORHIZA, Haller. CORAL-ROOT.

Gr. *korallion*, coral, and *rhiza*, root; the root being coral like.

FLOWERS ringent; the SEPALS and PETALS nearly alike, the lateral ascending and the upper arching; LIP recurved, spreading above, 2-ridged below, adherent at the base of the straightish column. ANTHER 2-lipped, terminal: POLLEN MASSES 4.—*Brownish or yellowish herbs, destitute of green foliage, with much branched and toothed coral like root-stocks, and simple scapes furnished with sheaths, bearing dull colored flowers in spiked raceme.*

1. C. MULTIFLORA, Nutt. *Large Coral-root.*

Scape many-flowered; *lip* wedge-ovate, 3-lobed, the middle lobe recurved, 3 times as long as the lateral ones; *ovary* and *capsule* oblong.

Woods, about the roots of trees; common. Aug., Sept. A brownish or purplish plant 10 to 18 inches high, with a few sheathing bracts instead of leaves, and 10 to 30 rather large brownish-yellow flowers. *Lip* whitish, spotted with crimson, ¼ to ⅓ inch long. *Spur* yellowish, conspicuous.

2. C. WISTARIANA, Conrad. *Smaller Coral-root.*

Scape few-flowered; *lip* oblong, minutely 2-toothed near the base, minutely notched; *spur* obsolete; *ovary* elongated.

Woods, near Philadelphia. June, July. Plant about 6 inches high, with 3 to 10 flowers, nearly as large as in C. multiflora.

3. C. INNATA, R. Brown. *Early Coral-root.*

Scape few-flowered; *lip* oblong, 2-toothed near the base; *ovary* and *capsule* oblong or club-shaped; *spur* obsolete.

Swamps and wet woods. May, June. *Scape* slender, 5 to 8 inches high, yellowish-green, with 3 or 4 membraneous sheaths. *Flowers* 5 to 10, dingy-yellowish; *lip* white, seldom spotted.

4. C. ODONTORHIZA, Nutt. *Small Late Coral-root.*

Scape several-flowered; *lip* roundish, entire, thin with a crisped or wavy margin; *ovary* and *capsule* globular or roundish oval; *spur* none.

Rich woods, about the roots of trees. Aug., Sept. *Scape* 8 to 10 inches high, a little enlarged at the base, with 2 or 3 sheaths. *Flowers* 10 to 12 in a terminal pendulous raceme, purplish; *lip* whitish, spotted with purple, with 2 oval protuberances on the palate.

4. APLECTRUM, Nutt. ADAM AND EVE.

Gr. *a*, without, and *plektron*, a spur; from the total want of the latter.

FLOWERS ringent. SEPALS and PETALS nearly equal. LIP with a short claw, free, 3 lobed, with a 3-ridged palate; without a spur. ANTHER situated a little below the summit of the column. POLLEN-MASSES 4.—*A perennial herb, with a simple scape, invested below with* 3 *greenish sheaths, springing up in May from the side of a thick globular solid* *bulb or corm, which also produces late in the summer a large oval, many-nerved and plaited petioled green leaf from its apex, lasting through the winter.*

A. HYEMALE, Nutt. *Putty-root. Adam-and-Eve.*

Rich shady woods, rare. May, June. *Bulbs* 2 or 3 together, horizontally connected, often 1 inch in diameter, filled with exceedingly glutinous matter. *Leaf* solitary, 4 to 6 inches long, elliptic acute at each end, on a petiole 2 to 3 inches long, inserted on the summit of the bulb. *Flowers* brownish, erect, racemed, on a scape 1 foot high. *Lip* whitish and speckled. *Capsule* large, smooth, nodding.

5. TIPULARIA, Nutt. CRANE-FLY ORCHIS.

Tipula, the crane-fly; from the fancied resemblance of the flowers.

SEPALS and PETALS spreading oblong or spatulate. LIP 3-lobed, prolonged underneath into a filiform spur twice as long as the flower. COLUMN narrow and wingless. ANTHER lid-like, terminal: POLLEN-MASSES 2, each 2-parted.—*A perennial herb, with solid bulbs, connected horizontally, producing a single ovate nerved leaf, and a long and naked slender scape, bearing a many-flowered raceme of greenish flowers, tinged with purple.*

T. DISCOLOR, Nutt. *Two-colored Crane-fly Orchis.*

Pine woods, rare. July. *Scape* 10 to 18 inches high, with 1 or 3 sheaths at the base. *Leaf* solitary on a slender petiole. *Flowers* small, nodding, greenish with a tinge of purple. *Spur* nearly 1 inch long.

6. ORCHIS, Linn. ORCHIS.

The ancient Greek name.

FLOWERS ringent. SEPALS and PETALS nearly equal, all, or nearly all converging upwards and arching over the column. LIP turned downwards, with a spur on the under side at base. POLLEN-MASSES pedicillate, collected into 2 large masses borne on a slender stalk, the base of which is attached to the 2 glands of the stigma: GLANDS contained in a common little pouch.—*Perennial herbs, with showy flowers in a spike.*

O. SPECTABILIS, L. *Showy Orchis.*

Leaves 2, radical, oblong-obovate, obtuse; *scape* angular, naked, few-flowered, scarcely longer than the leaves; *bracts* leaf-like, lanceolate; *spur* club-shaped, shorter than the ovary.

Shady woods. May, June. *Scape* 4 to 7 inches high, arising from a thick fleshy fibrous root, 5-angled, smooth. *Leaves* 3 to 5 inches long. *Sepals* and *petals* all vaulted, pink-purple; *lip* ovate, undivided, and with the obtuse *spur* white.

7. GYMNADENIA, R. Brown. NAKED-GLAND ORCHIS.

Gr. *gymnos*, naked, and *aden*, a gland.

FLOWERS as in Orchis. ANTHER-CELL parallel; the approximate glands naked.

G. TRIDENTATA, Lindl. *Three-toothed Gymnadenia.*

Lower leaf oblong, rather acute; *upper leaf* much smaller bract-like; *flowers* few, in an oblong terminal spike; *lip* wedge-oblong, 3-toothed at the apex.

Wet woods, and swamps. July. *Stem* slender, 6 to 12 inches high, with a single leaf. *Spike* 6 to 12-flowered, compact. *Flowers* pale yellowish-green. *Spur* club-shaped, curved upwards, longer than the ovary.

8. PLATANTHERA, Richard. FALSE ORCHIS.

Gr. *platus*, wide, and *anthera*, an anther.

FLOWERS as in Orchis, but with the lateral sepals spreading. ANTHER-CELLS diverging at the base; the two naked glands widely separated. LIP with a spur at the base.—*Perennials, with spicate or racemose flowers, often showy.*

* *Scape 2-leaved at the base; spur very long; lip entire.*

1. P. ORBICULATA, Lindl. *Round-leaved Orchis.*

Leaves very large, orbicular, spreading flat on the ground; *scape* bracted, bearing many flowers in a loose raceme; *upper sepal* orbicular, the lateral ovate; *lip* linear-spatulate, drooping, nearly 3 times as long as the sepals; *spur* curved, slender, linear-club-shaped.

Rich shady woods, Bear meadows, Centre Co., rare. July. *Scape* 1 to 2 feet high, with several small appressed scales. *Leaves* 2, very smooth, shining above, silvery underneath, 4 to 8 inches wide. *Flowers* yellowish-green. *Lip* ¾ to 1 inch long. *Spur* 1½ to 2 inches long.

** *Stem leafy; lip entire about the length of the spur.*

2. P. BRACTEATA, Torr. *Bracted Green Orchis.*

Lower leaves obovate, the upper oblong, and gradually reduced to lanceolate bracts; *petals* linear-lanceolate, erect; *lip* oblong-linear, truncate and minutely 2 to 3-toothed.

Damp woods. June. *Stem* 6 to 12 inches high, with 6 to 12 small, green flowers in a loose spike. *Lip* more than twice the length of the sac like, somewhat 2-lobed spur.

3. P. FLAVA, Gray. *Yellowish Orchis.*

Stem leafy; *lower leaves* oblong acute; *upper* lanceolate, acuminate; *spike* dense, cylindric; *petals* ovate; *lip* oblong, obtuse, toothed at the base, and with a small protuberance on the palate; *spur* filiform, rather shorter than the sessile ovary.

Wet places. June—Aug. *Stem* 10 to 20 inches high, with small greenish-yellow flowers, in a long spike at first dense, at length loose. *Leaves* about 3, with long sheaths, 3 to 7 inches long, and ¾ to 2 inches wide.

*** *Stem leafy; lip fringed along the side, undivided, shorter than the spur; ovary with an acuminate beak.*

4. P. CRISTATA, Lindl. *Crested Orchis.*

Lower leaves lanceolate, elongated, the upper gradually reduced to sharp-pointed bracts; *spike* oblong or cylindrical; *petals* rounded, crenate; *lip* ovate, with a torn-fringed margin; *spur* shorter than the ovary.

Swamps, rather common. June, July. *Stem* 1 to 2 feet high. ***Flowers*** small, yellow, in a crowded terminal spike.

5. P. CILIARIS, Lindl. *Yellow Fringed Orchis.*

Leaves oblong or lanceolate, the upper passing into pointed bracts; *spike* oblong, rather closely many-flowered; *lateral sepals* rounded, reflexed; *petals* linear fringed at the apex; *lip* oblong, about ½ the length of the spur.

Swamps and wet places, common. July, Aug. *Stem* 1 to 2 feet high, with a short spike of very showy flowers. *Leaves* sheathing at base, the lower ones 3 to 5 inches long. *Flowers* bright orange-yellow. *Lip* furnished with a very long and copious capillary fringe, ½ inch long.

6. P. BLEPHARIOGLOTTIS, Lindl. *White Fringed Orchis.*

Lower leaves lanceolate, channeled; *spike* oblong; *petals* oblong, slightly cut or toothed at the apex; *lip* oblong or lance-oblong.

Swamps, rare. June, July. *Stem* 1 to 1½ foot high, with the lower leaves 6 to 8 inches long. the upper gradually smaller. *Flowers* pure white, in a dense oblong spike. *Lip* fringed in the middle.

* * * * *Stem leafy; lip 3-parted shorter than the long spur, narrowed at the base into a claw. Flowers white or greenish.*

7. P. LACERA, Gray. *Ragged Green Orchis.*

Leaves oblong or lanceolate; *raceme* loosely many-flowered; *petals* oblong, linear, entire; *lip* 3 parted, with wedge-shaped segments; *spur* filiform, club-shaped, as long as the ovary.

Swamps and moist thickets. July. *Stem* 1 to 2 feet high, smooth, slender. *Leaves* few, 3 to 6 inches long, mostly acute. *Flowers* greenish-yellow, numerous. *Lip* with narrow divisions, deeply parted into a few long nearly capillary lobes.

* * * * * *Flowers purple.*

8. P. PYSCODES, Gray. *Small Purple Fringed Orchis.*

Leaves oblong, the upper passing into linear-lanceolate bracts; *raceme* cylindrical, densely many-flowered; *lower sepals* round-oval, obtuse; *petals* wedge-obovate or spatulate, denticulate above; *divisions of the lip* broadly wedge-shaped, many-cleft into a short fringe.

Moist meadows. July, Aug. *Stem* 2 feet high, smooth, slender. ***Flowers*** bright purple, in a crowded spike 4 to 7 inches long, small, very showy, fragrant. *Lip* short-stalked, scarcely ½ inch broad, its 3 fan-like, spreading segments, as well as the petals beautifully fringed. *Spur* nearly 1 inch long.

9. P. FIMBRIATA, Lindl. *Large Purple Fringed Orchis.*

Lower leaves oval or oblong, the few upper ones passing into lanceolate bracts; *spike* or *raceme* oblong, loosely-flowered; *lower sepals* ovate, acute; *petals* oblong, fringe-toothed down the sides; *lip* fan-shaped, with pendant, large divisions, many-cleft into a capillary fringe. (O. grandiflora, *Bigl.*)

Wet meadows, rare. June. A superb plant, 1½ to 2 feet high, with a thick, hollow, stem with a few sheathing bracts at base. *Leaves* 2 or 3 principal ones 4 to 7 inches long, 1 to 2 inches wide, the upper ones linear, 1 or 2 inches long. *Flowers* very large, showy, lilac-purple, in a terminal raceme 3 to 6 inches long. *Lip* much dilated, ¾ to 1 inch broad, with a deep and nearly capillary crowded fringe.

10. P. PERAMŒNA, Gray. *Fringeless Purple Orchis.*

Lower leaves oblong-ovate, the upper lanceolate; *spike* oblong or cylindrical, densely flowered; *lower sepals* round-ovate; *petals* rounded-obovate, raised on a claw; *lip* large, with broadly wedge-shaped divisions, the middle one 2-lobed. (O. fissa, *Pursh.* P. fissa, *Lindl.*)

Moist meadows and banks, rare. Aug. *Stem* 2 to 4 feet high, slightly winged. *Leaves* 4 to 6 inches long. *Flowers* large and very showy, violet-purple. *Lip* ¾ inch long, with minutely and variably toothed divisions. *Spur* 1¼ inch long.

9. ARETHUSA, Gronov. ARETHUSA.

Dedicated to the Nymph *Arethusa.*

FLOWER ringent, with the lanceolate SEPALS and PETALS nearly alike, united at the base, ascending and arching over the column. LIP spreading towards the summit, bearded inside. COLUMN adherent to the lip below, dilated at the apex. POLLEN-MASSES granular, 2 in each cell of the lid-like terminal anther.—*A beautiful low herb, with a sheathed scape from a globular solid bulb, bearing a single large purple flower, and a solitary, linear, nerved leaf.*

A. BULBOSA, L. *Bulbous Arethusa.*

Sphagnous swamps, rare. May. *Scape* 6 to 10 inches high, the lower part bearing 3 to 4 loosely sheathing scales, with lanceolate points, from the upper of which there is often a linear-lanceolate leaf. *Flowers* 1 to 2 inches long, very handsome, bright-purple. *Lip* yellow and white, bearded in the middle.

10. POGONIA, Juss. POGONIA.

Gr. *pogon,* a beard, from the bearded lip of the original species.

FLOWERS irregular, the SEPALS and PETALS separate and somewhat spreading. LIP crested or 2-lobed. COLUMN free, elongated, club-shaped, wingless. ANTHER terminal, stalked, with 2 farinaceous pollen-masses, 1 in each cell.—*Perennial herbs, with 1 to 5-leaved stems, and purplish flowers.*

1. P. OPHIOGLOSSOIDES, Nutt. *Adder's-tongue Pogonia.*

Root fibrous; *stem* bearing an oval or lanceolate, clasping leaf near the middle and a smaller leaf-like bract next the flower; *lip* spatulate, beard-crested and fringed.

Bogs, common. June, July. *Scape* 8 to 12 inches high. *Flowers* mostly solitary (sometimes 2 to 3), handsome, 1 inch long, pale-purple.

2. P. VERTICILLATA, Nutt. *Whorled Pogonia.*

Root of thick fibres; *stem* bearing a whorl of 5 oval or oblong-ovate pointed sessile leaves at the summit, 1-flowered; *sepals* narrowly linear, twice as long as the oblong petals; *lip* short, 3-lobed, the middle lobe wavy and crested.

Bogs, rare, June. *Scape* about 12 inches high. *Flowers* mostly solitary; the sepals 2 inches long, brown; *petals* paler and obtuse.

11. CALOPOGON, R. Brown. CALOPOGON.

Gr. *kalos,* beautiful, and *pogon,* beard; from the bearded lip.

SEPALS and PETALS nearly alike, spreading, distinct. LIP rather spreading, dilated at the summit, strongly bearded along the upper side. COLUMN free, winged at the apex.

ANTHER terminal, sessile; POLLEN-MASSES 2 (one in each cell).—*Scapes from a solid bulb, sheathed below by the base of the grass-like leaf, naked above, bearing several showy flowers.*

C. PULCHELLUS, R. Br. *Grass Pink.*

Leaf linear, 8 to 10 inches long, sheathing the base of the stem. *Scape* 12 to 18 inches high, 2 to 6-flowered. *Flowers* 1 inch broad, pink-purple, fragrant. *Sepals* and *petals* ovate-lanceolate, acute. *Lip* beautifully bearded towards the spreading summit with white, yellow, and purple clavate hairs.

12. SPIRANTHES, Richard. LADIES' TRESSES.

Gr. *speira*, a coil or curl, and *anthos*, blossom.

SPIKE spiral. FLOWERS somewhat ringent; the lateral sepals rather oblique at the base and nearly opposite the lip, the upper one cohering with the petals LIP oblong, concave and embracing the column below, with 2 callous processes at base. COLUMN arching, obliquely short-stalked, mostly with a 2-cleft beak. ANTHER dorsal: POLLEN-MASSES 2, club-shaped, affixed to a common gland.—*Perennial herbs, with clustered tuberous roots sending up mostly naked scapes. bearing a spirally twisted spike of small white flowers, bent horizontally,*

1. S. GRACILIS, Bigl. *Slender Ladies' Tresses.*

Leaves radical, ovate, caducous: *scape* very slender, smooth, sheathed; *spike* slender, with the flowers in a straight or usually spiral row; *bracts* ovate, pointed; *lip* spatulate-oblong, strongly wavy crisped.

Hilly woods and sandy plains. July, Aug. *Scape* 8 to 12 inches high, erect, with a few sheathing scales or leaflets. *Leaves* 1 to 2 inches long, thin, sometimes falling off before the flowers expand. *Flowers* white, 1-5 to ¼ inch long; the *calli* at first oval, at length elongating and incurved.

2. S. CERNUA, Richard. *Nodding Ladies' Tresses.*

Leaves radical, linear-lanceolate, veined, those of the stem smaller, passing into bracts; *spike* dense, minutely pubescent; *bracts* ovate-lanceolate, pointed; *lip* oblong, furnished with 2 minute callosities at the base.

Wet grassy places, common. Aug.—Oct. *Scape* 6 to 18 inches high; the root leaves 4 to 12 inches long. *Spike* thick, 3 to 8 inches long, seldom twisted. *Flowers* white or cream-color, fragrant.

13. GOODYERA, R. Brown. RATTLESNAKE PLANTAIN.

Dedicated to *John Goodyer*, an early English botanist.

FLOWERS ringent. CALYX herbaceous, upper sepal vaulted. LIP saccate at the base, sessile, over the 2 lower sepals. COLUMN small, straight. POLLEN-MASSES 2, consisting of angular grains, loosely cohering by a manifest web.—*Perennial herbs, with a root of thick fibres from a fleshy somewhat creeping rootstock, bearing a tuft of thickish petioled leaves next the ground, and small greenish white flowers in a spike on a slender scape.*

1. G. pubescens, R. Brown. *Rattlesnake Plantain.*

Leaves radical, ovate, conspicuously reticulated and blotched with white; *scape* sheathed, with numerous flowers in a crowded spike; *lip* inflated with an abrupt ovate apex; *stigma* rounded at the summit.

Rich woods. July, Aug. *Scape* 8 to 12 inches high. *Leaves* 1 to 2 inches long, contracted at base into a winged petiole, scarcely half as long, dark green, veined with white. *Flowers* whitish, in a terminal oblong spike.

2. G. repens, R. Brown. *Smaller Rattlesnake Plantain.*

Small and slender; *leaves* ovate-lanceolate, somewhat reticulated with white; *flowers* several in a loose 1-sided spike; *lip* inflated, with an oblong obtuse apex; *stigma* distinctly 2-toothed.

Rich woods, under evergreens, and on mountains. Aug. *Scape* 6 to 8 inches high. *Leaves* 1 inch long. *Flowers* greenish-white.

14. LISTERIA, R. Brown. TWAYBLADE.

In honor of *Martin Lister*, an eminent British botanist.

Sepals and petals nearly alike, spreading or reflexed. Lip mostly drooping, longer than the sepals, 2-lobed or 2-cleft. Column wingless: stigma with a rounded beak. Anther dorsal, ovate: pollen-masses powdery, in 2 masses, joined to a minute gland.—*Perennial herbs, with fibrous roots, the stem bearing a pair of opposite sessile leaves in the middle, and a spike or raceme of greenish or brownish purple small flowers.*

1. L. australis, Lindl. *Twayblade.*

Leaves ovate; *raceme* loose and slender; *flowers* very small, on pedicels twice the length of the ovary; *lip* linear, slightly sagittate at the base, 3 or 4 times as long as the sepals, 2-parted, with the divisions linear-setaceous.

Damp thickets, rare. June. *Plant* 4 to 6 inches high. *Leaves* ½ inch long. *Flowers* small, purplish on minutely glandular-pubescent pedicels.

2. L. convallarioides, Hook. *Large Twayblade.*

Leaves oval-roundish, sometimes somewhat cordate at base, often acute; *raceme* loose, pubescent; *flowers* on slender pedicels; *lip* wedge-oblong, 2-lobed, at the spreading apex, and 1-toothed on each side at the base; *sepals* narrowly lanceolate, spreading, twice as long as the lip.

Damp mossy woods, rare. June. *Stem* very slender, 5 to 10 inches high, sheathed with a few bracts. *Leaves* nearly 1 inch long, ⅔ as wide. *Flowers* dark brown and green, the purplish lip nearly ½ inch long.

15. CYPRIPEDIUM, Linn. LADY'S SLIPPER.

Gr. *Kupros*, Venus, and *podion*, a sock or slipper.

Sepals spreading; the 2 anteriar distinct, or commonly united into one under the lip. Petals similar but usually narrower, spreading. Lip a large inflated sac, somewhat slipper-shaped. Column short, 3-lobed, the middle lobe dilated and petaloid, the lateral bearing a 2-celled anther under each of them. STIGMA terminal.—*Perennial herbs, with tufted fibrous roots, large many-nerved plaited leaves, sheathing at the base, and solitary or few large and showy flowers.*

* *Stem leafy,* 1 *to* 3-*flowered. Flowers yellow and white.*

1. C. PUBESCENS, Willd. *Large Yellow Lady's Slipper.*

Stem leafy; *sepals* and linear wavy-twisted petals longer than the lip, pointed; *lip* flattened laterally, very convex and gibbous above; *sterile stamen* triangular.

Bogs and damp low woods, rare. May, June. *Stem* 2 feet high, pubescent. *Leaves* large, pubescent, 3 to 6 inches long, ovate-lanceolate, plaited, acute. *Flowers* 1 to 3, greenish-yellow, spotted with purplish-brown. *Lip* 1½ to 2 inches long, much inflated, pale yellow.

2. C. PARVIFLORUM, Salisb. *Small Yellow Lady's Slipper.*

Leaves oval, pointed; *sepals* ovate or ovate-lanceolate; *lip* flattish above and below; *sterile stamen* triangular, acute.

Rich low woods. May, June. *Stem* 10 to 15 inches high. *Leaves* clasping the base, pubescent, 3 to 5 inches wide, strongly veined. *Flowers* yellowish, fragrant, the perianth more brown-purple than in C. pubescens. *Lip* bright yellow, ¾ to 1 inch long.

3. C. CANDIDUM, Muhl. *White Lady's Slipper.*

Leaves oblong-lanceolate, acute; *sepals* ovate-lanceolate; *lip* flattish, laterally convex above; *sterile stamen* lanceolate.

Low grounds, rare. May. *Stem* 5 to 10 inches high, slightly pubescent, 1-flowered. *Petals* and *sepals* greenish. *Lip* white, ¾ inch long.

** *Scape naked,* 2-*leaved at the base. Flowers purplish.*

4. C. ACAULE, Ait. *Common Lady's Slipper.*

Downey; *scape* leafless, 1-flowered; *leaves* 2, oblong, obtuse; *sepals* oblong-lanceolate, pointed, nearly as long as the linear petals; *lip* drooping, obovoid, with a fissure in front; *sterile stamen* rhomboid, pointed. (C. humila, Salisb.)

Moist woods and sides of mountains, common. May, June. *Scape* 8 to 12 inches high, with a bract at the top. *Leaves* 5 to 7 inches long, 2 to 4 inches wide, plaited and downy. *Flowers* solitary, large purplish or pale pink. *Lip* nearly 2 inches long, veiny, purple or sometimes nearly white.

ORDER 118. **CANNACEÆ.**—*Indian Reed Family.*

Tropical plants with the nerves of the leaves diverging from a midrib, the irregular perianth with 3 *petaloid filaments, only one of which is fertile, with a* 1-*celled anther.* FRUIT a 3-celled capsule. SEED round, not winged.

CANNA, Linn. INDIAN REED.

The Hebrew name of the *reed.*

PERIANTH unequal, variable in the number of its parts, scarcely lip-shaped. STAMENS petaloid, only one with half an anther on its edge. STYLE flat, straight, nearly free. OVARY 3-celled, with many ovules. FRUIT membraneous, 3-celled, with a deciduous granular surface. SEEDS round, smooth.—*An extensive genus of herbaceous tropical plants,* *with erect stems bearing distant sheathing leaves and handsome flowers in spikes or racemes.*

C. Indica, L. *Indian Shot. Indian Reed.*

A beautiful plant often found in cultivation, native of the East Indies. *Stem-leaves* 1 to 2 feet long, and 3 to 6 inches wide. *Flowers* scarlet and yellow, borne in a spike.

Order 119. **AMARYLLIDACEÆ.**—*Amaryllis Family.*

Chiefly bulbous and scape bearing herbs, with linear flat root leaves and regular 6-androus flowers, the tube of the 6-parted perianth coherent with the 3-celled ovary. Anthers introrse. Style single. Capsule 3-celled, loculicidal, many-seeded. Seeds with fleshy albumen.

1. AMARYLLIS, Linn. Amaryllis.

A poetical name.

Perianth with 6-petal-like similar divisions. Stamens 6, inserted in the throat of the perianth: anthers versatile. Capsule membranaceous, 3-lobed.—*A splendid genus, with the long linear leaves and scape from a coated bulb, and the showy flowers issuing from a 1 to 2-leaved spathe.*

A. Atamasco, L. *Atamasco Lily.*

Spathe tubular, 2-cleft, 1-flowered; *perianth* funnel-form; *stamens* and *style* declined.

Shady woods, rare. June. *Leaves* a foot long, linear, concave, smooth. *Flowers* solitary, white and pink, 3 inches long, on a scape 6 inches high.

A. formosissima, L. *Jacobea Lily.* A beautiful flower from Mexico, sometimes cultivated. *Flower* dark red, on a scape 6 to 10 inches high.

2. AGAVE, Linn. American Aloe.

Gr. *agavos*, wonderful, in allusion to A. Americana, the *Century-plant.*

Perianth tubular-funnel-form, persistent, 6-parted; the divisions narrow, nearly equal. Stamens 6, soon exserted: anthers linear. Capsule coriaceous, 3-celled, many-seeded. Seeds flattened.—*A splendid American genus, with mostly thick and fleshy radical leaves, often spiny or cartilaginous teeth, and a large many-flowered pyramidal panicle on a scape.*

A. Virginica, L. *False Aloe.*

Stemless, herbaceous; *leaves* linear-lanceolate, fleshy, smooth, with cartilaginous serratures on the margin; *scape* simple, smooth; the *flowers* scattered in a loose spike, with leaf-like scales.

Rocky banks, southern part of the State. Sept. *Scape* 3 to 6 feet high, round, loosely spicate above. *Flowers* greenish-yellow, very fragrant.

A. Americana, L. *American Aloe. Century Plant.* A splendid herbaceous plant from tropical America, is sometimes found in our conservatories. *Leaves* radical, 3 to 6 feet long, 4 to 12 inches wide, very thick, spinose-toothed. *Scape* rising to the height of 15 to 25 feet, bearing a pyramidal panicle of yellow flowers.

3. HYPOXIS, Linn. STAR-GRASS.

Gr. *hypos* beneath, and *oxus*, sharp; on account of the pointed base of the fruit.

SPATHE 2-leaved. PERIANTH persistent, 6-parted, spreading, the 3 outer divisions somewhat herbaceous. STAMENS 6, with erect anthers. CAPSULE crowned with the withered or closed perianth, not opening by valves. SEEDS roundish.—*Acaulescent small herbs, with grassy and hairy linear leaves, and yellow flowers on slender scapes from a solid bulb.*

H. ERECTA, L. *Star-grass.*

Leaves linear, grass-like; *scape* umbellately 3 to 4-flowered, mostly shorter than the leaves.

Meadows and open woods, common. July. *Scape* 4 to 6 inches high. *Leaves* all radical, 6 to 12 inches long, ¼ inch wide. *Flowers* usually 4, yellow within, greenish without.

CULTIVATED EXOTICS.

4. GALANTHUS, Linn. SNOW-DROP.

Gr. *gala*, milk, *anthos*, flower; on account of the whiteness of the flowers.

FLOWERS spathaceous. SEPALS 3, concave; *corona* formed of 3 small emarginate petal-like segment; *stigma* simple.—*An ornamental bulbous exotic, sending up in early spring a scape with a single white flower.*

G. NIVALIS, L. *Snow-drop.*

Leaves linear, radical, keeled, acute; *scape* 1-flowered. Native of the Alps, flowering in early spring. *Scape* 3 to 6 inches high, arising from a perennial bulb, bearing a single, large nodding flower as white as snow, issuing from a spathe *Crown* (petals) striate with green.

5. NARCISSUS, Linn. DAFFODIL. JONQUIL.

Gr. *narke*, stupor; from the effects produced by the smell of some species.

PERIANTH regular, 6-parted. CROWN monophyllous, bell-form, salver-form, or with the tube funnel-form. STAMENS 6, short. STYLE longer than the stamens: STIGMA 3-parted.—*Showy bulbous exotics, with linear or ensiform leaves, and yellow straw-color or white flowers, issuing from a withering compressed spathe, opening on one side.*

1. N. JONQUILLA, L. *Jonquil.*

Leaves linear; *scape* 1 to 3-flowered; *segments* of the perianth spreading, elliptical or spatulate, acute; *cup* (corona) bell-shaped, crenate. Native of Spain. April, May. *Scape* 9 to 12 inches high, roundish, slender, bearing a few fragrant flowers, of a rich chlorine yellow, 1½ to 2 inches in diameter. *Cup* ½ inch long. *Leaves* 8 to 10 inches long, with the edges somewhat rolled.

2. N. PŒTICUS, L. *Poet's Narcissus.*

Scape 1-flowered; *segments* of the perianth, imbricate at base, somewhat reflexed, nearly round; *crown* short, flat, rotate, crenulate; 3 *anthers* shorter than the tube. Native of South Europe. June. *Scape* about 1 foot high, bearing a single white flower, 1½ to 2 inches in diameter; the cup or crown singularly adorned with circles of crimson, white and yellow.

3. N. PSEUDA-NARCISSUS, L. *Daffodil.*

Scape 2-edged, straight, striated; *segments* of the *perianth* ovate or spatulate-ovate, sulpher-yellow; *crown* very long, with a crenate-serrate orifice. Native of England. April, May. *Leaves* linear, 9 to 12 inches long, striate, veined. *Scape* 9 to 12 inches high, bearing at the top a single large flower, about 2 inches in diameter, commonly doubled by cultivation. *Cup* 1½ to 2 inches long, orange-yellow.

4. N. SULPHUREUS, L. *Sulpher-colored Daffodil.*

Scape 2-edged; *leaves* linear, flat; *spathe* 1-flowered; *segments* of the *perianth* elliptic-spatulate; *crown* somewhat bell-form, crenate. May, June. *Flowers* straw-colored, 2 inches in diameter, on a scape 1 foot high. *Crown* ½ inch long, orange-yellow. *Style* long.

6. LEUCOJUM, Linn. SNOW-FLAKE.

PERIANTH regular, 6-parted: SEGMENTS equal, spreading. STAMENS 6, equal: ANTHERS long. STYLE elavate, longer than the stamens.—*Exotic bulbous plants, with ensiform leaves and often numerous white flowers issuing from a terminal spathe.*

L. ÆSTIVUM, L. *Summer Snow-Flake.*

Leaves long, ensiform; *spathe* many-flowered, long; *divisions* of the *perianth* regular, oval. June. A pretty border flower; native of Austria. *Scape* 1 to 2 feet high. *Leaves* 1 to 2 feet long, ½ inch wide. *Spathe* 2 to 3 inches long, with 3 to 10 flowers, on peduncles at last 1½ to 2½ inches long. *Flowers* white; the divisions tipped with green.

ORDER 120. **HŒMODORACEÆ.**—*Bloodwort Family.*

Herbaceous plants, with fibrous perennial roots, equitant leaves and perfect 3 *to* 6 *androus regular flowers, which are usually more or less woolly outside; the tube of the* 6-*lobed perianth coherent with the whole surface, or with merely the lower part, of the* 3-*celled ovary.* STYLE single, sometimes 3-partible. CAPSULE crowned or inclosed by the persistent perianth, 3-celled, loculicidal, 3-many-seeded.

ALETRIS, Linn. STAR-GRASS.

Gr. *Aletris*, a female slave who grinds corn, in allusion to the apparent mealiness of the flowers.

PERIANTH cylindrical, tubular-bell-shaped, rough-wrinkled:

on the outside, 6-cleft at the summit. STAMENS 6, inserted at the base of the lobes, included. STYLE awl-shaped, 3-cleft at the apex. CAPSULE ovate, inclosed in the roughened perianth, 3-celled, many-seeded, opening at the summit.—*Perennial and smooth stemless herbs, with very little fibrous roots, spreading clusters of thin flat lanceolate leaves, and small white or yellowish flowers, in a slender spiked raceme.*

A. FARINOSA, L. *Star-grass. Colic Root.*

Leaves lanceolate, acuminate, smooth; *flowers* pedicellate, oblong-tubular; *lobes* lance-oblong.

Grassy sandy or gravelly woods, not common. July, Aug. *Scape* 2 feet high, with several minute bract-like leaves. *Flowers* white, appearing as if covered with a rough powder.

ORDER 121. IRIDACEÆ.—*Iris Family.*

Herbs with equitant 2-ranked leaves, and regular or irregular perfect flowers, the tube of the 6-cleft petal-like perianth coherent with the 3-celled ovary, and 3 distinct or monodelphous stamens with extrorse anthers. FLOWERS from a 2-leaved spathe, usually showy and ephemeral. STYLES single: STIGMAS 3. CAPSULE 3-celled, loculicidal, many-seeded.

1. IRIS, Linn. FLOWER-DE-LUCE.

Gr. *Iris*, the rainbow deified; on account of the bright and various color of the blossoms.

PERIANTH 6-cleft, the 3 outer divisions spreading or reflexed, the 3 inner smaller and erect. STAMENS distinct, placed before the outer divisions of the perianth, and under the 3 petal-like stigmas. CAPSULE 3 to 6-angled. SEEDS flat.—*Perennials, with sword-shaped or grassy leaves and large blue, white and yellow flowers.*

1. I. VERSICOLOR, L. *Blue Flag.*

Stem stout angled on one side, more or less flexuous; *leaves* sword-shaped; *perianth* beardless; *ovary* obtusely triangular with the sides flat; *capsule* oblong, turgid, with rounded angles.

Wet places, common. May, June. *Stem* 2 to 3 feet high, rarely branched, from a large fleshy creeping root. *Leaves* ¾ inch wide. *Flowers* 2 to 6 at the summit of the stem, blue, variegated with green, yellow and white at the base.

2. I. VIRGINICA, L. *Slender Blue Flag.*

Stem slender, round, smooth; *leaves* narrowly linear; *perianth* beardless; *ovary* 3-sided, each side deeply 2-grooved; *capsule* triangular, acute at both ends.

Wet meadows, rare. June. *Root* tuberous, creeping. *Stem* 1 to 2 feet high, somewhat flexuous, round. *Flowers* 3 to 6 at the summit of the stem, blue and yellow, more delicate than in the preceding.

3. I. CRISTATA, Ait. *Crested Iris.*

Scape mostly 1-flowered, as long as the leaves; *perianth* bearded, the beard crested

Mountains, southern part of the State. April, May. *Scape* 10 to 15 inches high, bearing a solitary flower. *Flowers* blue and yellow.

CULTIVATED EXOTIC SPECIES.

4. I. PUMILA, L. *Dwarf Iris.*

Scape short, 1-flowered; *spathe* shorter than the tube; reflexed sepals narrower than the erect petals. April, May. Native of Hungary. A handsome dwarf species, cultivated in the edgings of walks *Leaves* numerous, 4 to 6 inches long, broad-sword-shaped, suberect. *Flowers* large, deep purple, bearded on a very short scape.

5. I. OCHROLEUCA, L. *Yellow Iris.*

Beardless; *leaves* ensiform, depressed, striate; *scape* sub-terete, many-flowered; *ovary* nearly round, somewhat 6-angled. July. Native of the Levant. *Stem* 2 to 4 feet high. *Leaves* 1½ to 2 feet long. *Flowers* yellow or sulphur-colored. *Capsule* 2 inches long, round.

6. I. GERMANICA, L. *Flower-de-Luce. Fleur-de-Lis.*

Stem many-flowered; *leaves* long-ensiform; *sepals* reflexed, bearded; *petals* emarginate, bent inwards at the point. Native of Germany, common in gardens. June· *Stem* 2 to 3 feet high. *Leaves* numerous, 1½ to 2 feet long, ¾ to 1 inch wide *Flowers* 3 to 4 inches in diameter, purple. *Sepals* with a beautiful yellow and white beard.

7. I. XIPHIUM, L. *Bulbous Iris. Spanish Flag.*

Root bulbous; *leaves* linear, strongly channelled, the margins confluent towards the apex; *scape* few-flowered. June, July. Native of Spain. *Leaves* 6 to 10 inches high, thick and fleshy, ¼ inch in diameter, white on the upper or hollow side, round towards the point. *Flowers* very showy, blue yellow and white, the outer perianth lobes short, on a scape 10 to 12 inches high.

2. SISYRINCHIUM, Linn. BLUE-EYED GRASS.

Gr. *sus*, a hog, and *rugchos*, a snout; from a fancy that hogs are fond of rooting it up.

PERIANTH 6-parted; the divisions equal, spreading. STAMENS 3, monodelphous. STYLE short: STIGMAS 3, involute, filiform. CAPSULE globular-3-angled. SEEDS globular.—*Low slender perennials, with fibrous roots, grassy or lanceolate leaves, and small mostly blue flowers in umbelled clusters from a 2-leaved spathe.*

S. BERMUDIANA, L. *Common Blue-eyed Grass.*

Scape winged, naked or 1 to 2-leaved; *leaves* narrow and grass-like; *spathe* umbellately few-flowered; *divisions* of the perianth obovate, more or less notched at the end, and bristle-pointed from the notch.—Var. ANCEPS (S. anceps, *Cav.*) has a broadly winged scape, and the outer leaf of the very unequal spathes longer than the flowers.—Var. 2. MUCRONATUM (S. mucronatum, *Michx.*) has a slender and narrowly winged scape, very narrow leaves, those of the spathe acute, unequal, one of them usually longer than the flowers.

Moist meadows, common among grass. June—Aug. *Scape* 6 to 10 inches high.

Flowers small, delicate, blue, changing to purplish, 4 to 6 opening in succession. *Spathe* often purplish. There are various intermediate forms.

CULTIVATED EXOTICS.

3. PARDANTHUS, Linn. BLACKBERRY LILY.

Gr. *pardalis*, a panther, and *anthos*, flower; the flowers are spotted like the panther.

SPATHE of 2 or 3 ovate short bracts. PERIANTH regular, 6-parted; the divisions equal. STAMENS 3, with thread-like filaments. STIGMA straight or incurved, fixed by the base, subfiliform.—*An ornamental garden plant, with yellowish and reddish spotted flowers.*

P. CHINENSIS, L. *Blackberry Lily.*

Stem round, flexuous, leafy; *leaves* ensiform, vertical, sheathing; *panicle* somewhat dichotomous and corymbose; *perianth* flat, spreading; *segments* lance-linear. July, Aug. Native of South Africa. Common in cultivation. *Stem* 2 to 3 feet high. *Leaves* tapering to an acute point. *Flowers* yellow, spotted with red, 1 to 1½ inch in diameter. *Fruit* composed of numerous black glossy seeds attached round the rachis, resembling a blackberry.

4. CROCUS, Linn. SAFFRON. CROCUS.

Named from the youth *Crocus*, who, according to Grecian mithology, was changed into this flower.

PERIANTH funnel-form, the segments united at base into a slender tube. STAMENS 3. STIGMA 3-cleft, convolute, crested.—*Bulbous plants, with a radical 1 to 2-leaved thin transparent spathe, the long tube of the flowers nearly or quite sessile upon the bulb.*

1. C. SATIVA, L. *Saffron Crocus.*

Leaves linear, revolute on the margins; *stigma* 3-parted, as long as the corolla, reflexed. Sept. From Asia. *Leaves* radical, with a longitudinal white furrow above. *Flower* nearly sessile on the bulb, with a long white tube, and purple elliptical segments. *Stigmas* long, emarginate, exsert of a deep orange color. The stigmas compose the saffron of the shops so much used for medicinal and coloring purposes. There is a variety with yellow perianths.

2. C. VERNUS, L. *Spring Saffron.*

Leaves short, linear; *stigmas* included within the flower, with 3 short wedge-shaped segments. Native of the Alps. *Scape* 1 to 2 inches high, 3-sided. *Flowers* mostly purple, often yellow, pale blue or white, very variable; *tube* very slender, gradually enlarged upwards, closed at the mouth with a circle of hairs; *limb* bell shaped, shorter than the tube. *Anthers* yellow, sagittate. March, April.

5. TIGRIDIA, Linn. TIGER FLOWER.

Name in reference to the large spotted flowers.

SPATHE 2-leaved, carinate, 1-flowered. PERIANTH 6-

parted, with oblong segments, upright-spreading; the alternate ones the broadest. STAMENS 3, monodelphous: FILAMENTS united into a long tube: ANTHERS subovate, double. STYLE filiform, the length of the tube. CAPSULE oblong, 3-sided: SEEDS numerous, roundish, covered with a pulp.—*Showy South American bulbous plants, with large, very evanescent yellow and red spotted flowers.*

T. PAVONIA, L. *Tiger Flower.*

Stem simple, flexuous; *leaves* sword-shaped, veined; *segments* flat; *petals* panduriform. July—Sept. A superb plant, native of Mexico and Peru. *Stem* 2 to 2½ feet high, erect, round, leafy, somewhat branched. *Leaves* erect, 8 to 12 inches long, smooth. *Flowers* 5 to 6 inches broad, yellow, variegated with scarlet, crimson and purple, very evanescent, lasting but a few hours, but a new one appears daily for several weeks.

ORDER 122. **DIOSCOREACEÆ.**—*Yam Family.*

Twining herbs or undershrubs, from large tuberous roots or knotted rootstocks, ribbed and netted-veined leaves on petioles and small diœcious 6-androus and regular flowers in spikes. OVARY adherent, 3-celled. STYLES 3, united below or distinct. FRUIT usually a membranaceous 3-angled or winged capsule.

DIOSCOREA, Plumier. YAM.

In honor of the celebrated Greek naturalist, *Dioscorides.*

FLOWERS very small, diœcious. STAMENS 6 at the base of the divisions of the 6-parted perianth: FILAMENTS subulate. STYLES distinct nearly to the base. CAPSULE 3-celled, triangular, 3-winged. SEEDS 1 or 2 in each cell, flat, with a membranaceous wing.—*Climbing perennials, with alternate often heart shaped leaves, and inconspicuous greenish flowers in axillary branched racemes or spikes.*

D. VILLOSA, L. *Wild Yam-root.*

Herbaceous; *leaves* mostly alternate, sometimes nearly opposite or in fours, more or less heart-shaped, pointed, 7 to 11 ribbed.—Var. QUATERNATA, (D. quaternata, *Walt.*) has the leaves more acuminate and 7-nerved, the lateral nerves 2-parted. Thickets and old fields, common. July. A slender vine twining over bushes, sometimes 10 or 12 feet long. *Flowers* minute, greenish-yellow, the *sterile* in pendulous panicles; the *fertile* in pendulous simple racemes.

ORDER 123. **SMILACEÆ.**—*Smilax Family.*

Herbs or shrubs, often climbing, with ribbed and conspicuously netted veiny leaves, regular 6-androus flowers with the 6-parted perianth free from the 3-celled ovary.—FLOWERS diœcious or perfect. OVARY 3-celled, 1 or many-seeded. FRUIT a few to many-seeded berry.

SMILAX, Tourn. GREENBRIER.

An ancient Greek name of obscure meaning.

Diœcious or polygamous. PERIANTH of 6 equal spreading segments, deciduous. STAMENS mostly 6, inserted at the base of the perianth segments: FILAMENTS short. STIGMAS 3, thick, on a very short style. BERRY globular, 1 to 3-celled, 1 to 3-seeded. SEEDS globose, suspended, orthotropous.—*Shrubs, or rarely perennial herbs, often evergreen and prickly, climbing by tendrils on the petioles, with greenish stems, cordate or ovate leaves, and small flowers in axillary peduncled umbels.*

SEC. I. SMILAX proper.—*Stems* woody, often prickly; *ovules* solitary.

* *Leaves broad, thickish, often persistent.*

1. S. ROTUNDIFOLIA, L. *Common Greenbrier.*

Stem nearly round; *branchlets* more or less 4-angular; *leaves* round-ovate, often broader than long, slightly cordate, abruptly short-pointed, 5-nerved; *peduncles* scarcely longer than the petioles.

Moist thickets, common. June. *Stems* armed with stout scattered prickles, often climbing 20 to 30 feet. *Flowers* yellowish-green in small globose axillary umbels. *Berries* bluish-black.

2. S. QUADRANGULARIS, Willd. *Square-stemmed Greenbrier.*

Branches and *branchlets* square, armed with stout scattered prickles; *leaves* ovate or ovate-lanceolate, acuminate, cordate at base, 3 to 5-nerved; *peduncles* about the length of the petioles.

Dry woods. June, July. *Leaves* about 3 inches long, ½ as wide, thinnish, sometimes minutely rough-ciliate on the margin. *Flowers* greenish-yellow. *Berries* black.

* * *Leaves, broad, thin, entirely deciduous; prickles bristle-like.*

3. S. HISPIDA, Muhl. *Hispid Greenbrier.*

Stem round, the lower part very hispid; *leaves* ovate, mostly heart-shaped, pointed, strongly 5-nerved; *peduncles* 6 to 10-flowered, 2 or 3 times the length of the petioles.

Moist thickets. June. *Stem* climbing high, densely beset below with shining brown weak and slender prickles; the flowering branches often naked. *Leaves* 3 to 5 inches long, minutely rough on the margins, bright green on both sides. *Peduncles* 1½ to 2 inches long.

SEC. II. COPROSMANTHUS, Torr.—*Stem* herbaceous, not prickly. *Leaves* long-petioled, thin.

4. S. HERBACEA, L. *Carrion-Flower.*

Stem erect and recurving, or climbing; *leaves* ovate-oblong or rounded, mostly heart-shaped, 7 to 9-nerved, mucronate or pointed, smooth; *tendrils* sometimes none; *peduncles* very long, compressed.

Moist meadows and river-banks, common. June. *Stem* 3 to 6 feet long, climbing or leaning on other plants. *Leaves* very variable, on petioles 1 to 3 inches long. *Flowers* numerous, on peduncles 3 to 6 inches long, yellowish-green in globose axillary umbels of about an inch in diameter, exhaling the stench of carrion.

ORDER 124. TRILLIACEÆ.—*Trillium Family.*

Herbaceous plants, with simple stems, verticillate, net-veined leaves, and large terminal mostly solitary trimerous flowers. PERIANTH 6-parted. STAMENS 6 to 10. OVARY free, 3 to 5-celled, with as many styles. FRUIT succulent, 3 to 5-celled. SEEDS numerous.

1. TRILLIUM, Linn. TRILLIUM.

Lat. *trilex,* triple; all the parts being in threes.

FLOWERS perfect. SEPALS 3, lanceolate, spreading, herbaceous, persistent. PETALS 3, larger. STAMENS 6, with linear adnate anthers, on short filaments. STYLES 3, awl-shaped, distinct or united at base, stigmatic down the inner side. BERRY 3-sided, ovate, 3-celled. SEEDS horizontal, several in each cell.—*Low perennial herbs, with a stout simple stem rising from a short and abrupt tuberous rootstock, bearing at the summit a whorl of* 3 *broadly ovate leaves, and a terminal large flower.*

1. T. CERNUUM, L. *Nodding Trillium. Wake-Robin.*

Leaves broadly rhomboid, pointed, nearly sessile; *petals* white, oblong-ovate, pointed, recurved, somewhat wavy.

Moist woods. May, June. *Stem* slender 10 to 15 inches high. *Leaves* 3 to 5 inches in diameter, nearly round. *Flower* white, pendulous beneath the leaves, on a peduncle 1 to 2½ inches long. *Sepals* oblong-lanceolate, green, 1 inch long. *Petals* ¾ to 1 inch long, ⅓ to ½ inch wide.

2. T. ERECTUM, L. *Purple Trillium. Birth-root.*

Leaves broadly rhomboid, abruptly acuminate; *petals* dark dull purple, ovate, somewhat pointed, flat, spreading.

Rich woods, common. May. *Stem* 12 to 15 inches high. *Leaves* 3-nerved, 3 to 6 inches long. *Flower* on a peduncle 2 inches long, soon reclining. *Petals* 1 to 1½ inch long, greenish outside. *Ovary* brown-purple. Medicinal.

3. T. GRANDIFLORUM, Salisb. *Large-flowered Trillium.*

Leaves obovate-rhomboid, pointed, barely sessile; *petals* obovate, spreading from an erect base, longer and much broader than the sepals, white, changing to rose-color.

Rich woods, rare. June. *Stem* 10 to 12 inches high. *Flower* on a slightly inclined peduncle, which is 2 or 3 inches long. *Petals* 2 to 2½ inches long, broadest near the apex.

4. T. ERYTHROCARPUM, Michx. *Painted Trillium.*

Leaves ovate, acuminate, rounded at the base, short petioled; *petals* ovate or oval-lanceolate, pointed, wavy, widely spreading, nearly twice as long as the sepals shorter than the peduncles.

Cold damp woods. May, June. *Stem* 8 to 12 inches high. *Leaves* long acuminate, 3-nerved, 3 to 4 inches long, ⅔ as wide. *Petals* 1 inch long, white, painted with purple lines at the base. Medicinal.

5. T. SESSILE, L. *Common Sessile Trillium.*

Leaves ovate or oblong, sessile or nearly so, acute; *petals* lanceolate, erect, much longer than the sepals, dark dull purple.

Rich woods, rare. April, May. *Stem* 6 to 8 inches high, smooth. *Leaves* rather thick. 1½ to 2½ inches long, 1 to 2 inches wide, smooth and entire. *Sepals* green, ¾ inch long. *Petals* narrow, 1 inch long.

6. T. NIVALE, Riddell. *Snowy Trillium.*

Small; *leaves* oval or ovate, obtuse; *petals* oval-lanceolate, obtuse somewhat wavy, white, as long as the peduncle, longer than the sepals.

Rich shady woods, rare. April. *Stem* 2 to 4 inches high, from a thick tuberous root. *Leaves* 1 to 2 inches long, by ½ to 1 inch wide. *Sepals* green, much narrower than the petals. *Petals* ¾ to 1 inch long. *Styles* long and filiform.

2. MEDEOLA, Gronov. INDIAN CUCUMBER-ROOT.

Named after the sorceress *Medea*, from its supposed medicinal virtues.

PERIANTH revolute, of 3 sepals and 3 petals. STAMENS 6, inserted at the base of the perianth: FILAMENTS thread-like, longer than the linear-oblong anthers. STYLES 3, filiform, recurved-diverging, deciduous. BERRY spherical, 3-celled, few-seeded.—*A perennial herb, with a simple slender stem rising from a horizontal and tuberous white rootstock, bearing a whorl of* 5 *to* 10 *sessile leaves near the middle and another of* 3 *smaller ones at the top, subtending a sessile umbel of small recurved flowers.*

M. VIRGINICA, L. *Cucumber Root.*

Leaves of the lower whorl obovate-lanceolate, pointed; *upper ones* ovate.

Rich damp woods, common. June. *Stem* 1 to 2 feet high, erect. *Flowers* 3 to 6, greenish-yellow, reflexed, with long dark red reflexed stigmas.

ORDER 125. LILIACEÆ.—*Lily Family.*

Herbs, with parallel-nerved sessile or sheathing leaves, regular perfect 6-(rarely 4)-merous flowers with a petal-like 6-merous perianth free from the 2 to 3-celled ovary.—STAMENS 6 inserted into the perianth; ANTHERS attached by a point. STYLE single; STIGMA simple or 3-lobed. FRUIT a 3-valved loculicidal capsule or berry, few-many-seeded.

TRIBE 1. ASPARAGEÆ. THE ASPARAGUS TRIBE.

Fruit a few seeded berry, 2 to 3-celled. *Rootstocks* creeping or tuberous.

1. ASPARAGUS, Linn.

The ancient Greek name.

PERIANTH 6-parted, spreading above. STAMENS 6, with peltate anthers. STYLE short: STIGMA 3-lobed. BERRY spherical, 3-celled; *cells* 2-seeded.—*Perennials, with much-branched stems from thick and matted rootstocks, narrow leaves in clusters, and small greenish-yellow axillary flowers.*

A. OFFICIANALIS, L. *Garden Asparagus.*

Stem herbaceous, erect, rounded, much branched; *leaves* thread-like, fasciculate and flexible; *peduncles* jointed in the middle.

Cultivated in gardens, and naturalized. June. *Stem* 1 to 3 feet high. *Flowers* small, solitary, drooping. *Berry* globose, red.

2. POLYGONATUM, Tourn. SOLOMON'S SEAL.

Gr. *polus*, many, and *gonu*, knee, alluding to the many jointed stems and rhizoma.

PERIANTH tubular, 6-lobed at the summit. STAMENS 6, inserted on or above the middle of the perianth-tube, included. OVARY 3-celled: STYLE slender: STIGMA capitate or triangular. BERRY globular, blue or black, the cells 1 to 2-seeded.—*Perennial herbs, with simple erect or curving stems from thick and knotted creeping rootstocks, mostly alternate and sessile or half clasping nerved leaves, and axillary nodding greenish flowers.*

1. P. CANALICULATUM, Pursh. *Great Solomon's Seal.*

Stem stout, angled or channelled; *leaves* oblong-ovate, obtusely pointed, partly clasping, smooth, nearly equally many-nerved; *peduncles* 2 to 6-flowered, smooth; *filaments* smooth, shorter than the anthers, inserted on the middle of the perianth-tube. (Convallaria canaliculatum, *Muhl.*)

Rich sandy river banks, common. June. *Stem* 3 to 5 feet high, curved. *Leaves* green on both sides. *Perianth* cylindrical-oblong, greenish-white.

2. P. PUBESCENS, Pursh. *Smaller Solomon's Seal.*

Stem round, or slightly grooved on one side; *leaves* ovate-oblong or elliptical-lanceolate, minutely downy and glaucous underneath, with 3 to 5 principal nerves, sessile; *peduncles* 1 to 2-flowered, smooth: *filaments* minutely glandular puberulent, inserted near the summit of the perianth. (Convallaria pubescens, *Muhl.*)

Woods and rocky banks, common. May, June. *Stem* 1 to 2 feet high, slightly curved. *Perianth* ½ inch long, cylindrical-oblong, greenish. *Ovules* often 6 in each cell.

3. SMILACINA, Desf. FALSE SOLOMON'S SEAL.

Name a diminutive of *Smilax*, to which this genus, however, has little resemblance,

PERIANTH 4 to 6-parted, spreading deciduous. STAMENS 4 to 6, inserted at the perianth-lobes: FILAMENTS slender: ANTHERS short. OVARY 2 to 3-celled. STYLES short and thick: STIGMA obscurely 2 to 3-lobed. BERRY globular, 1 and 2-seeded.—*Perennial herbs, with simple stems from creeping or thickish rootstocks, alternate nerved leaves, and white often fragrant flowers in a terminal simple or compound raceme.*

SEC. I. SMILACINA, Desf.—*Divisions* of the *perianth* and *stamens* 6.

1. S. RACEMOSA, Desf. *False Spikenard.*

Minutely downy; *stem* somewhat flexuous; *leaves* numerous, oblong or oval-lanceolate, acuminate, ciliate, abruptly short-petioled; *raceme* compound, panicled; *ovary* 3-celled.

Moist woods. May, June. *Stem* zigzag, 2 feet high from a thick and fleshy rootstock. *Leaves* 4 to 6 inches long, about ⅓ as wide, contracted into a long acumination. *Flowers* very numerous, small, white, on white pedicels, with white exserted filaments. *Berries* pale red, speckled with purple, aromatic.

2. S. STELLATA, Desf. *Star-flowered Solomon's Seal.*

Smooth or nearly so; *leaves* 7 to 11, oblong-lanceolate, acute, minutely ciliate, slightly clasping, thickish; *raceme* simple, few-flowered; *ovary* 2-celled.

Moist banks. May, June. *Stem* about 12 inches high, round. *Leaves* smooth, glaucous beneath, 4 to 6 inches long, ¾ to 1 inch wide, tapering to the apex. *Flowers* about 8, white, stellate. *Berries* blackish.

3. S. TRIFOLIA, Desf. *Three-leaved Solomon's Seal.*

Smooth, dwarf; *leaves* 3, sometimes 2 or 4, oblong or oval-lanceolate, short-pointed, narrowed into a sheathing base; *raceme* simple, *ovary* 2 to 3-celled.

Swamps. May, June. *Stem* 3 to 6 inches high. *Leaves* smooth on the margin, about 2 inches long, ⅓ as wide. *Raceme* terminal, erect, consisting of 4 to 6 white flowers. *Perianth-lobes* spreading. *Anthers* brownish. *Berries* red.

SEC. II. MAIANTHEMUM, Desf. *Divisions* of the *perianth* and *stamens* 4.

4. S. BIFOLIA, Ker. *Two-leaved Solomon's Seal.*

Smooth or nearly so; *stems* low, mostly 2-leaved; *leaves* heart-shaped, petioled or sessile; *raceme* simple, crowded.

Shady moist woods, common. May. *Stem* 3 to 5 inches high, with 2 or sometimes 3 leaves near the summit, and often a larger radical leaf on a long petiole. *Flowers* white, small, fragrant, in an oblong raceme, one inch long. *Berries* reddish, speckled.

4. CLINTONIA, Raf.

Dedicated to *De Witt Clinton.*

PERIANTH 6-parted, bell-shaped, lily-like, deciduous. STAMENS 6, inserted at the base of the segments: FILAMENTS long and thread-like: ANTHERS linear-oblong. OVARY ovoid-oblong, 2-celled; STYLE long, compressed: STIGMA depressed. BERRY ovoid, blue, few to many-seeded.—*Acaulescent perennials, with slender creeping rootstocks, sending up a naked scape, sheathed at the base by 2 to 4 large oblong or oval ciliate leaves, and bearing rather large, umbelled or rarely single, white or greenish flowers at the summit.*

1. C. BOREALIS, Raf. *Northern Clintonia.*

Umbel 2 to 7-flowered; *ovary* with 10 to 12 ovules in each cell. (Dracæna borealis, *Ait.*)

Cold moist mountain woods. June. *Scape* 6 to 8 inches high. *Leaves* radical, 5 to 8 inches long. *Perianth* ½ to ¾ inch long, greenish-yellow. *Berry* blue.

2. C. UMBELLATA, Torr. *Small-flowered Clintonia.*

Umbel 12 to 30-flowered; *cells* of the berry 2-seeded. (Convallaria umbellata, *Michx.*)

Rich woods, through the Alleghenies. June. *Scape* many-flowered, 9 to 12 inches high. *Leaves* 2 to 5, 6 to 9 inches long. *Flowers* 15 to 30, white, speckled with purple ¼ to ½ inch long, odorous.

5. CONVALLARIA, Linn. LILY OF THE VALLEY.

Lat. *convallis*, a valley, the locality of some species.

PERIANTH bell-shaped, 6 parted. STAMENS 6, divergent, arising from the base of the segment. BERRY globose, 2-celled.—*An elegant sweet-scented perennial herb, often cultivated in gardens, with mostly 2 radical ovate leaves, and a slender scape bearing white flowers in a single rank.*

C. MAJALIS, L. *Lily of the Valley.*

Scape naked, smooth, semi-cylindric; *leaves* nearly radical, ovate; *raceme* simple, one-sided.

Allegheny mountains, common in cultivation. May. *Scape* 6 inches high. *Leaves* 4 to 7 inches long, ovate-elliptical, pointed.

TRIBE 2. ASPHODELEÆ. THE ASPHODEL TRIBE.

Fruit a few to many-seeded capsule, 3 celled, loculicidal. *Seeds* anatropous or amphitropous.

Sec. 1. Not bulbous.

6. HEMOROCALLIS, Linn. DAY LILY.

Gr. *hemera*, a day, and *kallos*, beautiful; its flowers lasting but a day.

PERIANTH funnel-form, lily-like, the short tube enclosing the ovary, the spreading limb 6-parted. STAMENS 6, inserted on the throat of the perianth: FILAMENTS long and thread-like, declined: STIGMA simple. CAPSULE rather fleshy, 3-angled, 3-valved, with several black round seeds in each cell.—*Showy perennial exotics, with fleshy fibrous roots, radical linear, keeled 2-ranked leaves and yellow or reddish flowers,* (which collapse and decay after expanding for a single day) *borne on tall scapes.*

1. H. FULVA, L. *Common Day Lily.*

Inner divisions of the perianth wavy and obtuse, the *veins* branched.

Damp grounds, escaped from cultivation and naturalized. July. *Leaves* numerous, about 2 feet long, and an inch wide, smooth, acute. *Flowers* large, tawny orange or reddish. *Scape* round, thick, smooth, 3 feet high. *Style* striate.

2. H. FLAVA, L. *Yellow Day Lily.*

Divisions of the perianth flat, the veins undivided. Native of South Europe. July. *Leaves* 1 to 2 feet long, ½ inch wide, keeled. *Scape* 2 feet high, branching. *Flowers* large, yellow, sweet scented. Cultivated.

3. H. GRAMINEA, L. *Grass-leaved Day Lily.*

Leaves grass-like, linear, keeled; 3 inner perianth lobes larger, waved, the outer smaller. Native of South Europe. July. *Leaves* 6 to 18 inches long, narrower and much smaller than in either of the preceding species. *Scape* 9 to 12 inches high, 3 to 6-flowered. *Perianth* orange-yellow on the inside, reddish on the outside. Rare in Cultivation.

7. FUNKIA, Gært. JAPAN DAY LILIES.

PERIANTH funnel-bell-shaped, 6-parted. STAMENS 6. FILAMENTS long, declined, the upper ones the shortest: ANTHERS oblong, fixed by their sides, turned up at the ends. STYLE long, declined, superior, furrowed: STIGMA obtusely 3-angled. CAPSULE 3-sided, 3-celled, 3-valved. SEEDS very numerous, flat.—*Ornamental perennial herbs, from Japan, with somewhat heart-shaped long-petioled leaves, and white or bluish flowers on bracted scapes.*

1. F. ALBA, Gært. *White Day Lily.*

Leaves cordate, ovate, acuminate; *perianth* funnel-form, with a long tube. Aug., Sept. *Scape* 1 to 2 feet high. *Leaves* smooth, on long radical petioles 3 to 5 inches wide. *Flowers* large, white, very fragrant, 3 to 4 inches long, somewhat crowded, each axillary to a large bract. *Anthers* yellow.

2. F. CŒRULIA, Gært. *Blue Day Lily.*

Leaves heart-shaped, on petioles; *perianth* tubular-bell-shaped, swelled. July, Aug. *Scape* 2 to 3 feet high. *Bracts* yellowish. *Flowers* bluish-purple, 2 to 3 inches long, the slender tube enclosing the ovary; *border* inflated, round-bell-shaped. *Anthers* blue.

3. F. JAPONICA, Gært. *Japan Day Lily.*

Leaves lanceolate or ovate-lanceolate; *perianth* funnel-form, with somewhat reflexed segments. July, Sept. *Leaves* 3 to 4 inches long, narrowed into a petiole of 4 to 5 inches in length. *Scape* slender, 12 to 18 inches high. *Flowers* much smaller than in the preceding species, pale-purple, 1 to 2 inches long.

8. ASPHODELUS, Linn. KING'S SPEAR.

Gr. *a*, privative, *sphallo*, to surpass; a flower not surpassed in beauty.

PERIANTH 6-parted, spreading, with 6 valves, covering the ovary. STAMENS 6, issuing from the valves. CAPSULE globular, many-seeded.—*Fine garden plants with showy flowers.*

1. A. LUTEUS, L. *King's Spear. Yellow Asphodel.*

Stem leafy; *leaves* linear 3-nerved. A showy garden perennial from Sicily, of the easiest culture and rapid increase. June. *Stem* 2 to 3 feet high, thickly invested with the long linear hollow tapering striped leaves. *Flowers* yellow, in a very long spike.

2. A. RAMOSUS, L. *Branching Asphodel.*

Stem naked, branched; *leaves* ensiform, keeled, smooth; *peduncle* as long as the bract. Native of South Europe. June. Not so tall as the preceding, but with longer white flowers.

SEC. II. *Bulbous.*

9. ORNITHOGALUM, Tourn. STAR-OF-BETHLEHEM.

Gr. *ornithos*, a bird, and *gala*, milk; why so called is not obvious.

PERIANTH deeply 6-parted, spreading above the middle the divisions several, nerved. FILAMENTS 6, flattened-awl-shaped. STYLES 3-sided: STIGMA 3-angled. CAPSULE roundish-angular, with a few roundish seeds in each cell.—*Perennial herbs, with radical leaves and a naked racemose or corymbed scape from a coated bulb.*

O. UMBELLATUM, L. *White Star-of-Bethlehem.*

Flowers corymbose, 5 to 8 on long spreading pedicels; *sepals* green in the middle outside.

Moist meadows, naturalized, common in gardens. Native of England. June. *Scape* 5 to 8 inches high. *Leaves* linear and narrow, emarginate, 5 to 8 inches long, with a white line on the upper side. *Flowers* white, few in a loose corymb. *Perianth-lobes* beautifully marked with a longitudinal green stripe on the outside.

10. ALLIUM, Linn. ONION. GARLIC.

The ancient Latin name of the Garlic.

PERIANTH of 6 entirely colored sepals, which are distinct or united at the very base, 1-nerved, becoming dry and more or less persistent. FILAMENTS awl-shaped or dilated at their base. STYLE filiform: STIGMA simple. CAPSULE lobed, 3-celled, 3-valved, with a few black and rough seeds in each cell.—*Strong-scented and pungent acaulescent herbs, with the mostly radical leaves and the scape from a coated bulb, the flowers in a simple umbel, and a 1 to 2-valved spathe.*

* *Umbel often densely bulb-bearing with or without flowers.*

1. A. VINEALE, L. *Field Garlic.*

Scape slender, clothed with the sheathing bases of the leaves below the middle; *leaves* round, hollow, slender, channelled above; *filaments* much dilated, the alternate one 3-cleft, the middle divisions anther bearing.

Moist meadows and fields, naturalized and some places very troublesome. June. *Bulb* ovoid, small. *Leaves* 6 to 12 inches long. *Scape* 1 to 2½ feet high, bearing a spathe of 2 small bracts at the top, and an umbel of rose-colored and green flowers at the top with which bulbs are sometimes intermixed.

2. A. CANADENSIS, Kalm. *Wild Meadow Garlic.*

Scape leafy only at the base; *leaves* narrowly linear, flattish; *umbel* few-flowered; *filaments* simple, dilated below, about as long as the perianth.

Moist fields, common. May, June. *Leaves* very long and narrow. *Scape* 12 to 15 inches high, round, smooth, bearing a spathe of 2 ovate acute bracts at the top, with a head of bulbs and flowers. *Flowers* whitish or pale rose-color, on pedicels; the *bulbs* are sessile, each furnished with a bract beneath.

* * *Umbel bearing only flowers.*

3. A. CERNUUM, Roth. *Nodding Garlic. Wild Onion.*

Scape naked, angular, elongated, often nodding at the apex, bearing a loose or drooping many-flowered umbel; *leaves* linear, elongated, sharply keeled; *sepals* oblong-ovate, acute, much shorter than the slender filaments; *ovary* 6-toothed at the summit, becoming a roundish 3-seeded capsule.

Banks and steep rocks, common. July. *Scape* 10 to 12 inches high, bearing a loose umbel of 20 to 30 flowers. *Leaves* 8 to 12 inches long. *Flowers* white or rose-color. The variety with white flowers grows abundantly in steep rocky places along the Susquehanna. The plant is very strong-scented.

4. A. TRICOCCUM, Ait. *Wild Leek. Lance-leaved Garlic.*

Scape naked, bearing an erect many-flowered umbel; *leaves* lance-oblong or elliptical, flat; *sepals* obtuse, oblong; *capsule* strongly 3-lobed.

Rich shaded sandy woods, rare. July. *Bulbs* clustered, pointed, 2 inches long. *Leaves* 5 to 10 inches long, 1 to 1½ inch wide, acute, tapering into a petiole, appearing in early spring and decaying before flowering. *Scape* 12 to 15 inches high, bearing a thin 2-leaved deciduous spathe at the top, with an umbel of 10 to 20 white flowers.

5. A. TRIFLORUM, Raf. *Mountain Leek.*

Scape naked, terete, shorter than the leaves; *leaves* lanceolate, nerved; *umbel* few-flowered. Pursh.

Mountains, rare. May, June.

CULTIVATED EXOTIC SPECIES.

6. A. SATIVUM, L. *Common Garlic.*

Bulb compound; *stem* leafy, bulbiferous; *stamens* tricuspidate. Native of Sicily. July. *Stem* 3 feet high. *Flowers* small, white. *Bulbs* strong-scented and acrid.

7. A. SCHŒNOPRASUM, L. *Chives. Cives.*

Scape as long as the round subulate leaves. *Flowers* small, rose-color. June. Common in gardens.

8. A. PORRUM, L. *Leek.*

Stem compressed, leafy; *leaves* sheathing at base; *stamens* tricuspidate. Native of Switzerland. July. *Root* bearing a scaly cylindrical bulb. *Stem* 2 feet high, bearing long linear alternate sheathing leaves, and at the top a large umbel of small white flowers.

9. A. CEPA, L. *Common Onion.*

Scape fistulous, swelling towards the base, longer than the terete fistulous leaves. Native of Hungary. Universally cultivated for the kitchen. Culture has produced numerous varieties.

11. HYACINTHUS, Linn. HYACINTH.

A fabulous name.

PERIANTH sub-globose or bell-shaped, regular 6-cleft. STAMENS 6, issuing from the middle of the segments. OVARY with 3 necteriferous pores at the summit. CAPSULE 3-celled, about 2-seeded.—*Ornamental bulbous plants, native of the Levant, with fragrant white, pink blue and purple flowers.*

H. ORIENTALIS, L. *Common Hyacinth.*

Perianth funnel-form, half 6-cleft, swelled at the base. May. The hyacinth is a well known garden flower, long prized and cultivated. *Leaves* thick, linear-lanceolate, 3 to 6 inches long. *Scape* 5 to 10 inches high, thick, bearing a dense thyrsoid raceme of different shades of blue, pink, purple or white fragrant flowers.

12. POLYANTHOS, Linn. TUBEROSE.

Gr. *polus*, many, *anthos*, flower; the plant bearing numerous flowers.

PERIANTH funnel-form, incurved. FILAMENTS inserted into the throat. STIGMA 3-cleft. OVARY at the bottom of the perianth.—*A beautiful bulbous exotic, with white fragrant flowers.*

P. TUBEROSA, L. *Tuberose.*

Leaves linear-lanceolate; *flowers* alternate, in pairs; *perianth-lobes* oblong. Native of Ceylon. Aug., Sept. *Scape* scaly, 2 to 3 feet high, with white regular flowers of a delicious fragrance.

TRIBE 3. TULIPACEÆ. TULIP OR TRUE LILY TRIBE.

Fruit a many-seeded 3-celled loculicidal capsule. *Seeds* anatropous. *Perianth* 6-leaved.—*Bulbous.*

13. LILIUM, Linn. LILY.

The classical Latin name.

PERIANTH funnel-form or bell-shaped, colored, of 6 distinct sepals, spreading or recurved above, with a necteriferous furrow at the base, deciduous. STAMENS 6, somewhat adhering to the bases of the sepals: ANTHERS linear, versatile. STYLE elongated, somewhat club-shaped: STIGMA 3-lobed. CAPSULE oblong, 3-celled, containing numerous flat seeds densely packed in 2 rows in each cell.—*Perennial scaly bulbous herbs, with simple stems, numerous alternate-scattered or whorled short and sessile leaves and one to several large and showy flowers.*

* *Flowers erect, bell-shaped, the sepals narrowed below into claws.*

1. L. PHILADELPHICUM, L. *Wild Orange Lily.*

Leaves linear-lanceolate, the upper chiefly in whorls of 5 to 8; *flowers* 1 to 3 or sometimes 5, open-bell-shaped, with lanceolate sepals.

Open woods, hillsides and fence-rows, not rare. June—Aug. *Stem* 2 to 3 feet high, round, smooth, simple. *Leaves* 2 to 3 inches long, ¼ to ½ inch wide, 1 to 3-nerved. *Flowers* large, reddish-orange, the inside spotted with purple near the base, 2½ inches long, on a peduncle 1 to 3 inches long.

2. L. CATESBÆI, Walt. *Wild Red Lily. Catesby's Lily.*

Leaves linear-lanceolate, scattered; *flowers* solitary, open-bell-shaped, the long-clawed sepals wavy on the margin, and recurved at the summit, the margins of the claws involute.

Low sandy soil, and meadows, rare, Montour Co. July. *Stem* 12 to 18 inches high, bearing a single large terminal scarlet flower, spotted with dark purple and yellowish inside. *Sepals* ovate or rhombic-ovate, with the mid-vein green on the outside.

** *Flowers nodding, bell-shaped, the sessile sepals revolute.*

3. L. CANADENSE, L. *Wild Meadow Lily.*

Leaves remotely whorled, lanceolate, strongly 3-nerved, the margins and nerves rough; *flowers* mostly 3, sometimes 5 or more, long-peduncled, funnel-bell-shaped, the sepals recurved-spreading above the middle.

Moist meadows, common. June, July. *Stem* 2 to 3 feet high. *Flowers* 1 to 3, sometimes 5 to 20; pendulous, yellow or orange at the base, densely spotted with brown-purple inside and outside above, 2 to 3 inches long.

4. L. SUPERBUM, L. *Turk's-cap Lily. Superb Lily.*

Lower leaves whorled, lanceolate, pointed, smooth, 3-nerved, upper ones scattered; *flowers* often 3 to 40 in a pyramidal raceme, nodding with revolute sepals.

Rich low grounds rather common. July, Aug. A superb plant 3 to 5 feet high, with an erect, round, straight stem. *Flowers* bright orange, with numerous dark purple spots inside. *Sepals* 3 inches long, linear-lanceolate, beautifully and fully revolute.

CULTIVATED EXOTIC SPECIES.

5. L. TIGRINUM, L. *Tiger-spotted Lily.*

Leaves scattered, sessile, 3-nerved, the upper ones cordate-ovate; *sepals* revolute, papillose inside. Aug. Native of China, common in cultivation. *Stem* 4 to 6 feet high, woolly, bearing bulbs in the axils of the leaves. *Flowers* large, dark orange or reddish, spotted with black, in a pyramidal raceme. *Sepals* 4 to 6 inches long, beautifully revolute, scabrous on the midvein, inside.

*** *Flowers bell-shaped.*

6. L. BULBIFERUM, L. *Orange Lily. Fire Lily.*

Leaves scattered, 3-veined, pubescent when young; *flowers* bell-shaped, erect rough within. July. Native of Italy. *Stem* thick, round, 2 to 4 feet high, bearing small, roundish bulbs in the axils of the leaves. *Flowers* large, orange-colored, scabrous within. Common in cultivation.

7. L. CANDIDUM, L. *Common White Lily.*

Leaves scattered, lanceolate, narrowed at the base; *flowers* bell-shaped, smooth on the inside. July. Native of the Levant. A much cultivated and beautiful garden plant, with a thick stem, 3 to 4 feet high. *Flowers* large, snow-white, very fragrant, in a terminal raceme.

14. ERYTHRONIUM, Linn. DOG'S-TOOTH VIOLET.

Gr. *eruthros*, red, which is inappropriate as respects our species.

PERIANTH liliaceous, of 6 distinct lanceolate sepals, recurved or spreading above, deciduous, the 3 inner usually with a callous tooth on each side of the erect base and a groove in the middle. FILAMENTS 6, awl-shaped: ANTHERS oblong-linear. STYLE elongated. CAPSULE obovate, contracted at the base, 3-valved. SEEDS ovate.—*Nearly stemless bulbous perennials, with two smooth and shining flat leaves tapering into petioles and sheathing the base of the 1-flowered scape.*

1. E. AMERICANUM, Smith. *Yellow Dog's-tooth Violet.*

Leaves elliptical-lanceolate, involute at the point, spotted; *scape* naked; *sepals* oblong-lanceolate, obtuse, inner ones bidentate near the base; *style* club shaped; *stigmas* united.

Meadows in sandy soil, common. April, May. A beautiful little plant. *Scape* 6 to 9 inches high. *Leaves* 2, spotted with purple, and dotted 5 inches long, one of them nearly twice as wide as the other. *Flower* drooping, yellow, revolute in the sunshine, spotted near the base.

2. E. ALBIDUM, Nutt. *White Dog's-tooth Violet.*

Leaves elliptical-lanceolate, spotted, not dotted; *sepals* linear-lanceolate, the inner without lateral teeth; *style* thread-like and club-shaped; *stigma* 3 cleft.

Low thickets and sandy meadows, often in company with the other species. April, May. *Leaves* without an acumination, including the petiole 4 to 5 inches long, spotted with purple. *Scape* 6 to 7 inches high, bearing a single white flower. *Sepals* 1¼ inch long.

15. FRITTILLARIA, Linn. CROWN IMPERIAL.

Lat. *fritillus*, a chess-board; alluding to the checkered flowers.

PERIANTH bell-shaped, with a broad base and necteriferous cavity above the claw of each segment. STAMENS 6, as long as the sepals. SEEDS flat.—*Bulbous perennial exotics, with showy, but ill-scented flowers.*

1. F. IMPERIALIS, L. *Common Crown Imperial.*

Raceme comose, naked below; *leaves* lanceolate, acute. May, June. Native of Persia. A showy flower of easy culture, common in cultivation. *Stem* thick, 1 to 2 feet high, the lower part inserted with the long leaves, the upper part is naked, bearing at the top a cluster of several red or yellow nodding flowers beneath a crown formed by the pairs of leaves at the base of each pedicel.

2. F. MALEAGRIS, L. *Checkered Crown Imperial.*

Leaves alternate, linear, channelled; *stem* 1-flowered. May. Native of Britian *Stem* a foot high, with alternate, long, very narrow leaves. *Flower* usually solitary, large, nodding, and beautifully checkered with purple pale red or yellow.

16. TULIPA, Linn. TULIP.

Persian *thouliban*, a turban; alluding to the form of these magnificent flowers.

PERIANTH bell-shaped, with sepals. STAMENS 6, short, subulate: ANTHERS 4-angled. STIGMA thick. CAPSULE oblong, triangular. SEEDS flat.—*Bulbous exotic perennials, with radical leaves and a showy solitary flower on a scape.*

1. T. GESNERIANA, L. *Common Tulip.*

Leaves ovate-lanceolate; *flower* erect, smooth, with obtuse sepals. May. Native of Persia. There are more than 500 varieties enumerated in catalogues, with red, scarlet, crimson white yellow, brown, purple, striped, blotched and fringed flowers.

2. T. SUAVEOLENS, L. *Sweet-scented Early Tulip.*

Leaves linear-lanceolate; *flower* erect, smooth with acute sepals, the alternate ones lanceolate, the others ovate. Native of Persia. *Flowers* mostly yellow, fragrant, appearing in April.

TRIBE 4. ALOINEÆ.

Fruit 3-celled, 3-valved, with a loculicidal dehiscence, opening at the summit. *Seeds* numerous.—*Not bulbous.*

17. YUCCA, Linn. ADAM'S NEEDLE.

Jucca, the Indian name.

PERIANTH inferior globular or bell-shaped. STAMENS with awl-shaped filaments. STYLE none. CAPSULE oblong, with 3 obtuse angles 3-celled, many-seeded, opening at the summit. SEEDS flat.—*Evergreen perennials, with narrow filamentaceous radical leaves, and a scape of numerous white flowers, in a terminal panicled raceme or spike.*

1. Y. ANGUSTIFOLIA, L. *Narrow-leaved Yucca.*

Leaves long linear, filamentose on the margins, mucronate. Aug. Native of the Southern States. *Leaves* 10 to 15 inches long, ½ to ¾ inch wide, with white threads along the margin. *Panicled spike* terminal, on a scape 2 to 3 feet high, many-flowered. *Flowers* globular-bell-shaped, white.

2. Y. FILAMENTOSA, L. *Adam's Needle. Silk-grass.*

Leaves lance-linear, filamentose, mucronate; 3 inner sepals broad lanceolate; *capsule* large oblong-obovate. July, Aug. Native of the Southern States. *Leaves* 12 to 18 inches long, 1 to 2 inches wide, very filamentose on the margin. *Scape* 3 to 5 feet high, beaaing a terminal panicle of numerous white fragrant flowers. *Perianth* globose. *Stigmas* recurved, spreading.

ORDER 126. **MELANTHACEÆ.**—*Melanthium Family.*

Herbs, with perfect or polygamous and regular 6-merous and 6-androus flowers, the petaloid perianth free from the 3-celled ovary, extrorse anthers, and 3 (sometimes united) *more or less distinct styles.*

SUBORDER I. UVULARIEÆ. THE BELLWORT FAMILY.

PERIANTH soon deciduous, the divisions distinct, petaloid. STYLES united at the base or throughout. FRUIT a 3-celled few-seeded berry or loculicidal capsule.—*Stems from small perennial rootstocks and fibrous roots, ovate or lanceolate membranaceous sessile or clasping leaves, and perfect flowers on solitary or 1-flowered peduncles.*

1. UVULARIA, Linn. BELLWORT.

Name "from the flowers hanging on the *uvula*, or palate."

PERIANTH nearly bell-shaped, lily-like, the sepals spatulate-lanceolate, with a necteriferous groove or pit at the base of each. STAMENS 6, with short filaments: ANTHERS long and linear, adnate. STYLE deeply 3-cleft. CAPSULE triangular, 3-celled, 3-valved from the top, with a few obovoid seeds in each cell.—*Perennial herbs from creeping rootstocks, alternate sessile or clasping leaves, and pale yellow nodding, mostly solitary flowers.*

* *Leaves clasping, perfoliate.*

1. U. GRANDIFLORA, Smith. *Large-flowered Bellwort.*

Leaves oblong or elliptical-ovate, pale and very slightly pubescent underneath; *sepals* smooth within; *anthers* nearly pointless; *lobes* of the capsule with convex sides.

Rich woods, rare. May, June. *Stem* 12 to 15 inches high, passing through the perfoliate leaves near their bases, dividing into 2 branches at the top, one of which bears a large pendulous pale-yellow flower. *Perianth* 1½ inch long. *Anthers* ¾ inch long.

2. U. PERFOLIATA, L. *Perfoliate Bellwort.*

Leaves ovate or oblong-lanceolate, smooth, glaucous underneath; *sepals* granular-roughened inside; *anthers* pointed; *capsule-lobes* with concave sides.

Moist woods and thickets, common. May, June. *Stem* 8 to 12 inches high, passing through the perfoliate leaves near the base, 2-branched at the top. *Leaves* 2 to 3 inches long, ⅔ to 1 inch wide. *Flowers* pale-yellow, ¾ to 1 inch long.

* * *Leaves sessile.*

3. U. SESSILIFOLIA, L. *Sessile-leaved Bellwort.*

Low, smooth; *leaves* oval or lance-oblong, pale, glaucous underneath; *styles* united to the middle, longer than the obtuse anthers; *capsule* triangular ovate.

Low woods, common. May. *Stem* 6 to 10 inches high, forked near the summit. *Leaves* 1 to 1½ inch long. *Flowers* 1 to 2 on a slender axillary peduncle, cream-colored, ¾ inch long.

4. U. PUBERULA, Michx. *Puberulent Bellwort.*

Leaves shining, ovate, green, minutely puberulent, as well as the branches; *styles* united below, as long as the short-pointed anthers; *capsule* ovate, sessile.

Mountains, southern parts of the State.

2. PROSARTES, Don. PROSARTES.

Gr. *prosartas*, to hang from; in allusion to the suspended ovules or flowers.

PERIANTH bell-form, 6-parted, much as in Uvularia. STAMENS 6, the thread-like filaments inserted at the base of the perianth. OVARY 3-celled, with 2 ovules suspended from the summit of each cell. STYLES united into one: STIGMAS 3, short, recurved. BERRY ovoid, pointed, 3 to 6-seeded, red.—*Downy low herbs, widely branched above, with closely sessile, ovate leaves, and greenish-yellow drooping flowers on slender terminal peduncles, solitary or few in an umbel.*

P. LANUGINOSA, Don. *Pale-flowered Prosartes.*

Leaves ovate-oblong, acuminate, rounded or slightly heart-shaped at the base, closely sessile, downy underneath; *flowers* solitary or in pairs; *sepals* lance linear, acuminate, soon spreading, twice as long as the stamens. (Streptopus, *Michx.*)

Rich woods, rare. May. *Stem* 12 to 15 inches high, with 2 to 3 forks near the summit. *Flowers* greenish-yellow, the sepals ½ inch long, marked with conspicuous cross-veinlets like the leaves.

3. STREPTOPUS, Michx. Twist-Stalk.

Gr. *streptos*, twisted, and *pous*, foot, or stalk.

PERIANTH 6-parted, recurved spreading from a bell-shaped base, the 3 inner sepals keeled. STAMENS 6: FILAMENTS short, flattened: ANTHERS arrow-shaped. OVARY with many ovules in each cell: STYLES and even the stigmas united into one! BERRY red, roundish-ovoid, with several seeds in each cell.—*Herbs with somewhat stout stems, divergently spreading branches, ovate and acuminate round clasping leaves, and small flowers on slender filiform peduncles.*

1. S. AMPLEXIFOLIUS, DC. *Clasping Twist-Stalk.*

Leaves oblong-ovate, closely clasping, very smooth, glaucous beneath; *peduncles* abruptly bent or contorted near the middle; *anthers* acuminate, entire; *stigma* entire, truncate.

Low cold woods, rare. June. *Stem* 2 to 3 feet high, rough at the base, forked. *Flowers* greenish-white, on a filiform peduncle, bent round the clasping base of the leaves, rarely 2-flowered.

2. S. ROSEUS, Michx. *Rose Twist-Stalk.*

Leaves ovate-oblong, clasping, finely ciliate on the margin, green on both sides; *branches* sparingly bent with short bristly hairs; *anthers* 2-horned; *stigma* minutely 3-cleft.

Cold damp woods, rare. May. June. Per. *Stem* 12 to 18 inches high, 2 or 3-forked at the upper part. *Flowers* rose colored, 1 to 2 on filiform nodding peduncles.

SUB ORDER II. MELANTHIEÆ. THE TRUE COLCHICUM FAMILY.

PERIANTH mostly persistent, the sepals distinct or rarely their claws united. STYLES 3, seperate. FRUIT a 3-celled, 3-parted capsule.—*Herbs with acrid poisonous properties, and sometimes polygamous or diœcious flowers.*

4. MELANTHIUM, Gronov., L.

Gr. *melas*, black, *anthos*, flower; the flower becoming black after blossoming.

Polygamous. PERIANTH petaloid, rotate, deeply 6-parted; the segments somewhat cordate, raised on slender claws, with 2 glands at the base. STAMENS 6, on the claws of the perianth. STYLES short, awl-shaped, tipped with simple minute stigmas. CAPSULE ovoid-conical, 3-lobed, 3-celled, many-seeded.—*Tall perennials, with simple stems, lance-linear grass-like leaves, and an ample pyramidal panicle of cream-colored racemose flowers.*

1. M. VIRGINICUM, L. *Virginian Melanthium.*

Leaves linear-lanceolate, long; *sepals* ovate-hastate, at last oblong, flat, the glands distinct: *filament* cohering with the claws beyond the middle.

Wet meadows, rather common. July. *Stem* 3 to 4 feet high, leafy. *Leaves* 9 to 15 inches long, somewhat clasping at base. *Flowers* greenish-white, the perfect and sterile mixed, on short pedicels, in simple alternate racemes, together constituting a pyramidal panicle 10 to 15 inches long.

2. M. HYBRIDUM, Walt. *Hybred Melanthium.*

Leaves long-linear, nearly smooth, clasping the stem; *sepals* round-rhomboid or broadly ovate, wavy, the glands united; *filaments* involved in the lower part of the involute claws.

Low and high grounds, rare. July—Sept. *Stem* 2 feet high, leafy. *Leaves* varying from lance-linear to lanceolate. *Perianth* very open, yellowish-green.

5. VERATRUM, Tourn. FALSE HELLEBORE.

Lat. *vere*, truly, *atrum*, black; in allusion to the color of the flowers or root.

FLOWERS polygamous. PERIANTH of 6 spreading and separate sepals, more or less contracted at the base, without glands. STAMENS 6, free from the sepals and shorther than they, recurving. STYLES 3, short, awl-shaped. CAPSULE ovoid, membranaceous, 3-lobed, the carpels distinct at the summit.—*Somewhat pubescent perennials, with simple stems, plaited 3 ranked leaves, and raceme-panicled dull or dark flowers.*

V. VIRIDE, Ait. *White Hellebore. Indian Poke.*

Leaves broad-ovate, plaited; *panicle* pyramidal, with compound racemes.

Swamps and low grounds, common. June. *Stem* stout, very leafy to the top, 2 to 4 feet high. *Leaves* large, sheathing the stem at the base. *Flowers* yellowish-green, moderately spreading. *Root* very poisonous.

6. AMIANTHEMUM, Gray. FLY-POISON.

Gr. *amiantos*, pure, and *anthos*, flower; alluding to the unspotted glandless perianth.

FLOWERS perfect. PERIANTH widely spreading, the distinct petaloid sepals oval or obovate, sessile. FILAMENTS capillary. ANTHERS kidney-shaped or heart-shaped. STYLES filiform. CAPSULE ovoid conical, 3-lobed. SEEDS nearly wingless, 1 to 4 in each cell.—*Perennial herbs, from a bulbous base, with simple scape-like stems, linear-keeled grass-like leaves, and handsome flowers in a simple or rarely compound dense raceme.*

A. MUSCÆTOXICUM, Gray. *Fly-Poison.*

Leaves broadly linear, elongated, obtuse, as long as the scape; *raceme* simple, oblong or cylindrical; *capsule* abruptly 3-horned; *seeds* oblong with a fleshy red coat.

Shady swamps, rare. June. *Stem* 1 to 2 feet high. *Leaves* mostly radical, 10 to 15 inches long, ½ to 1 inch wide. *Raceme* 3 to 9 inches long, dense-flowered. *Perianth* and *stamens* white.

7. HELONIAS, Linn. UNICORN.

Gr. *helos*, a swamp; the place of its growth.

FLOWERS perfect. PERIANTH of 6 spatulate-oblong persistent sepals. STAMENS 6, longer than the sepals: ANTHERS roundish-oval, 2-celled, blue. STYLES 3, revolute, stigmatic along the inner side. CAPSULE obcordately 3-lobed, loculicidally 3-valved, the valves deeply 3-lobed, many-seeded.—*A smooth perennial, with a hollow naked scape from a tuberous rootstock, numerous leaves, and a simple short dense raceme of pale-purple flowers.*

H. BULLATA, L. *Purple-flowered Unicorn.*

Leaves inversely lanceolate or oblong-spatulate, flat, nerved; *scape* leafless. (H. latifolia, *Michx.*)

Sandy swamps, rare. May. *Scape* 1 to 2 feet high, thick and fleshy. *Leaves* 10 to 18 inches long, 1 to 1½ inch wide. *Flowers* purple, with obtuse sepals.

8. CHAMÆLIRIUM, Willd. DEVIL'S-BIT.

Gr. *chamai*, on the ground, and *leirion*, a lily; of no obvious application.

FLOWERS diœcious. PERIANTH of 6 spatulate-oblong sepals, persistent. STAMENS 6, longer than the sepals: FILAMENTS thread-like: ANTHERS yellow. FERTILE FLOWERS with rudimentary stamens. STYLES 3, linear club-shaped, stigmatic along the inner side. CAPSULE ovoid-oblong, not lobed, loculicidally 3-valved from the apex, many-seeded.—*A smooth perennial herb, with a slender stem from a thick premorse tuberous rootstock, clustered spreading leaves, and a long slender spiked racame of yellowish-white flowers.*

C. LUTEUM, Willd. *Unicorn Root. Blazing-star.*

Leaves flat, lanceolate, the lowest spatulate, tapering into a petiole; *fertile scape* very leafy; *sterile spike* nodding; *stamens* exserted. (Helonias dioica, *Pursh.*)

Low moist grounds, rather common. June. *Spike* at length 6 to 10 inches long, showy. *Root-leaves* 4 to 8 inches long, ½ to 1 inch wide, somewhat whorled at the base of the scape. *Flowers* small, very numerous, yellowish-white. The fertile plants are taller, more erect, but with fewer flowers. Medicinal.

ORDER 127. **JUNCACEÆ.**—*Rush Family.*

Grass-like or sedge-like herbs, with jointed stems and a regular persistent perianth of 6 *similar glumaceous sepals,* 6 *or rarely* 3, *stamens with introrse anthers, and a* 1 *to* 3-*celled ovary, forming a* 3-*valved* 3 *to many-seeded capsule.* STYLE single. SEEDS anatropous, with a minute embryo inclosed at the base of the albumen.

1. LUZULA, DC. Wood-rush.

Italian, *lucciola*, a glow-worm; from the dew glistening upon its flowers.

Perianth persistent, 6 parted, spreading. Stamens 6. Stigmas 3. Capsule 1-celled, 3-valved, 3 seeded.—*Perennials, with flat and soft usually hairy leaves and spiked-crowded or umbelled flowers.*

1. L. PILOSA, Willd. *Pilose Wood-rush.*

Leaves lance-linear, hairy; *peduncles* umbelled, simple, mostly 1-flowered; *sepals* pointed, shorter than the obtuse capsule; *seeds* tipped with a curved appendage.

Woods and banks. April, May. *Stem* 6 to 12 inches high, cæspitose at the base. *Radical leaves* numerous, 2 to 4 inches long, veined, fringed with long white hairs. *Panicle* 8 to 12-flowered, umbelled. *Flowers* reddish-brown.

2. L. CAMPESTRIS, DC. *Common Wood-rush.*

Leaves flat, linear, hairy; *spikes* 4 to 12, somewhat umbelled, ovoid, straw-color, some of them long-peduncled, others nearly sessile; *sepals* acuminate, awned, longer than the obtuse capsule; *seeds* with a conical appendage at the base.

Dry fields and woods. May. *Stem* 6 to 12 inches high, caespitose at base. *Leaves* grass-like 2 to 6 inches long, very hairy on the margins. *Flowers* reddish-brown, in ovoid or oblong nearly erect spikes.

2. JUNCUS, Linn. Rush. Bog-Rush.

The classical name, from *jungo*, to join, alluding to their use for bands.

Perianth spreading glumaceous, 6-parted. Stamens 6, or sometimes 3. Stigmas 3, subsessile. Capsule 3-celled, loculicidal, many-seeded.—*Chiefly perennials, with pithy stems, and cymose, panicled, or clustered small greenish or brownish flowers.*

* *Leaves none. Scapes naked and simple from matted running rootstocks. Stamens 3.*

1. J. EFFUSUS, L. *Common or Soft Rush. Bull-rush.*

Scape soft and pliant, finely striated; *panicle* diffusely much branched, many-flowered; *sepals* green, lanceolate, very acute, as long as the obovate very acute capsule; *stamens* 3.

Marshy ground, very abundant. June. *Scape* 2 to 4 feet high, erect, terminating in a long tapering point. *Panicle* bursting from a fissure in the side of the scape above the middle, sessile. *Flowers* greenish, with white anthers.

* * *Scapes naked, some of the sheaths at the base leaf-bearing. Stamens 6.*

2. J. SETACEUS, Rostkow. *Bristly Rush.*

Scape slender, filiform; *panicle* loose, rather simple, few-flowered; *sepals* lanceolate, very acute, especially the 3 exterior, longer than the obovate pointed capsule.

Swamps. June, July. A very slender species, growing in tufts about 2 feet high. *Scapes* sheathed at base, turning light chestnut-color. *Panicle* small, 20 to 30-flowered, bursting from the side of the scape, below the summit.

* * * *Stems leaf-bearing. Leaves round or flattened laterally knotted, or jointed.*

3. J. SCRIPOIDES, Lam. *Many-headed Rush.*

Stem erect, stout, round; *leaves* round; *panicle* rather simple, bearing 5 to 8 pale-green densely many-flowered spherical heads; *sepals* rigid, awl-shaped, and somewhat awned, especially the outer, as long as the triangular acuminate capsule; *seeds* barely pointed at each end.

Wet borders of streams, rather common. July, Aug. *Stem* 1 to 3 feet high, from a thickish creeping rootstock. Remarkable for its burr-like green heads, usually ⅓ inch in diameter.

4. J. PARADOXUS, E. Meyer, in Gray's Flora.

Stem stout and round; *leaves* terete or somewhat flattened; *panicle* decompound *heads* numerous, globular, 8 to 15-flowered; *sepals* lanceolate, somewhat awl-pointed, rigid; *seeds* conspicuously tailed at both ends.

Wet places, common. July, Aug. *Stem* 1 to 2½ feet high. *Heads* less dense, fewer-flowered, and sometimes smaller than the foregoing. "Remarkable for the loose white seed-coat prolonged at both ends into a tail longer than the body of the seed."

5. J. ACUMINATUS, Michx. *Sharp-fruited Rush* .

Stem erect, terete; *leaves* slender, nearly terete; *panicle* terminal, with rather slightly spreading branches; *heads* 3 to 8-flowered, chestnut-colored; *sepals* linear-lanceolate, very acute, shorter than the acutely triangular capsule; *seeds* tail-pointed at both ends.

Peat bogs and borders of ponds. July, Aug. *Stem* 10 to 15 inches high. *Flowers* pale-green or purplish, mostly 3 in a head. *Capsule* turning deep chestnut-brown.

* * * * *Leaves jointless, flat and open. Stamens* 3.

6. J. MARGINATUS, Rostkow. *Grass-leaved Rush.*

Stem leafy, erect, flattened; *leaves* linear, grass-like, nerved; *heads* globose, 3 to 8-flowered; *sepals* oblong, the 3 outer with the bracts slightly awned, the inner obtuse and pointless, as long as the globose capsule; *seeds* minutely pointed at both ends.

Moist sandy places, common. July. *Stem* 1 to 3 feet high, tuberous at the base, with numerous root-leaves. *Panicle* simple or compound. *Sepals* soft, chestnut-purplish, with a green keel.

* * * * * *Leaves channelled or involute, thread-form or almost setaceous. Stamens* 6.

7. J. TENUIS, Willd. *Slender Rush.*

Stems slender, wiry, simple, leafy only near the base; *leaves* setaceous-linear, channelled; *cyme* shorter than the involucral leaves; *flowers* solitary one-sided, nearly sessile; *sepals* lanceolate, very acute, a little longer than the obtuse capsule.

Low grounds and fields, very common. June, July. *Stem* caespitose, 10 to 13 inches high. *Flowers* green, shining, somewhat racemose or one-sided on the branchlets.

8. J. GERARDI, Loisel. *Black Grass.*

Stems simple, flattish, leafy, rigid; *leaves* linear-bristly, channelled; *panicle* terminal, cymose, longer than the involucral leaves, rather crowded; *sepals* ovate-oblong, obtuse, nearly the length of the obovoid obtuse capsule.

Borders of salt-marshes, common. Aug. *Stem* 10 to 18 inches high, slender. *Foliage* deep-green. *Outer sepals* deep chestnut-brown, with a deep green keel.

9. J. BUFONIUS, L. *Toad Rush.*

Annual; *stems* diffuse, low and slender, leafy, often branched at the base; *panicle* forking, spreading, the flowers remote; *sepals* lanceolate, awl-pointed, much longer than the oblong obtuse capsule.

Low grounds and roadsides, very common. June, Aug. *Stem* 3 to 9 inches high, tufted, divided towards the top. *Panicle* loose, spreading, few-flowered, pale-green. *Flowers* greenish.

****** *Stems leaf-bearing; leaves terete, short. Stamens* 6.

10. J. NODOSUS, L. *Jointed Rush.*

Stem erect, slender, 3 to 5-leaved; *leaves* terete, short; *heads* 1 to 2, or several and clustered, globose, 10 to 20-flowered; *sepals* lanceolate, awl-pointed, nearly as long as the slender 3-angled capsule.

Gravelly borders of streams, &c., common. Aug. *Rootstocks* slender. *Stem* 6 to 20 inches high. *Heads* in a loose panicle, or in a dense cluster. *Flowers* brownish or greenish.

ORDER 128. **PONTEDERIACEÆ.**—*Pickerel-weed Family.*

Aquatic herbs, with perfect more or less irregular flowers from a spathe; the petaloid 6-merous perianth free from the 3-celled ovary, and the 3 or 6 mostly unequal or dissimilar stamens inserted in its throat. PERIANTH-LOBES colored alike. STYLES 1: STIGMA 3 to 6-cleft. CAPSULE 3-celled, 3-valved, loculicidal. SEEDS numerous, with somewhat mealy albumen.

1. PONTEDERIA, Linn. PICKEREL-WEED.

Dedicated to *Pontedera*, Prof. at Padua at the beginning of the last century.

PERIANTH funnel-form, 6-cleft, 2-lipped; the 3 lower lobes spreading, and their claws, more or less seperate down to the base. STAMENS 6, unequally inserted, 3 near the base and 3 near the summit of the tube: ANTHERS oval, blue. OVARY 3-celled; 2 of the cells empty, the other containing a single suspended ovule. UTRICLE 1-celled, filled with the single seed.—*Stout herbs, growing in shallow water, with thick creeping rootstocks, producing erect long-petioled mostly cordate leaves, and a 1-leaved scape, terminated by a spike of violet-blue ephemeral flowers.*

P. CORDATA, L. *Common Pickerel-weed.*

Leaves arrow-heart-shaped, blunt; *spike* very dense, from a spathe-like bract.—Var. ANGUSTIFOLIA, Torr., has triangular-elongated and tapering leaves, scarcely cordate at base.

Ponds, common. July—Sept. *Stem* 1 to 2 feet high, bearing a single smooth glossy leaf, 4 to 7 inches long and 1½ to 3 inches wide. *Flowers* aggregated by 2s and 3s, sessile bright blue, with a pair of small yellow spots on the upper lobe.

2. HETERANTHERA, Ruiz & Pavon. MUD PLANTAIN.

Gr. *hetera* different, and *aner*, for anther; the anthers being dissimilar.

SPATHE several-flowered. PERIANTH salver-form, with a slender tube, the limb somewhat 6-parted. STAMENS 3, 2 of the anthers ovate, yellow, the 3d oblong or arrow-shaped, greenish. CAPSULE incompletely 3-celled, many-seeded.—*Creeping or floating low herbs, with mostly rounded long-*

petioled leaves, and a 1 to few-flowered spathe bursting from the sheathing side or base of a petiole, with blue or white flowers.

H. RENIFORMIS, Ruiz & Pavon. *Mud Plantain.*

Leaves round kidney-shaped; *spathe* oblong-acuminate, 3 to 5-flowered.

Muddy margins of streams. July, Aug. *Stem* prostrate and rooting in the mud, partly floating. *Leaves* semicircularly nerved, on petioles 2 to 3 inches long. *Flowers* white.

3. SCHOLLERA, Schreber. WATER STAR-GRASS.

Dedicated to *Frederick A. Scholler*, a German botanist.

PERIANTH salver-form, with 6 nearly equal lance-linear spreading segments on a very long filiform tube. STAMENS 3, with similar oblong-arrow-shaped anthers (or rarely an abortive fourth one): FILAMENTS nearly equal, subulate. CAPSULE oblong, invested by the withered perianth, 1-celled, many-seeded.—*A grass-like herb, growing wholly under water, only the small pale yellow flowers expanding on the surface, with slender branching stems, clothed with linear translucent sessile leaves and 1-flowered spathe.*

S. GRAMINEA, Willd. *Common Water Starwort.*

In flowing streams, common in the Susquehanna. July, Aug. *Stem* 2 to 3 feet long. *Leaves* 3 to 6 inches long, very narrow. *Flowers* yellow, with a tube 1½ inch long and a thick style.

ORDER 129. COMMELYNACEÆ.—*Spiderwort Family.*

Herbaceous plants, with jointed often branching leafy stems, and mostly perfect and 6-androus flowers, with the perianth free from the 2 to 3-celled ovary. PERIANTH in 2 rows; outer row herbaceous, 3-leaved; inner petal-like, ephemeral. STAMENS 6, hypogynous. STYLE 1: STIGMA undivided. CAPSULE 2 to 3-celled, 2 to 3-valved, loculicidal, 3 to several-seeded.

1. COMMELYNA, Dill. DAY-FLOWER.

Dedicated to the early Dutch botanists, *J. & G. Commelyn.*

PERIANTH in 2 rows; outer one 3-leaved, calycine; inner 3-leaved petal-like. STAMENS 6, unequal, 3 of them fertile, one of which is bent inward: 3 of them sterile and smaller, with imperfect cruciform anthers: FILAMENTS naked. CAPSULE 3-celled, 2 of the cells 2-seeded, the other 1-seeded or abortive.—*Herbaceous plants, with branching stems, lance-linear leaves contracted at the base into sheathing petioles, the floral one cordate and clasping, folded together or hooded* *and forming a kind of spathe inclosing the blue or white ephemeral flowers.*

1. C. ANGUSTIFOLIA, Michx. *Narrow-leaved Day-flower.*

Stem usually reclining and rooting at the joints; *leaves* lanceolate or linear-lanceolate; *spathe* heart-shaped, folded together; *peduncles* usually divided, the smaller branch 1-flowered or sterile; *petals* unequal, the lower one much smaller; *capsule* 2-celled.

Damp rich woods and banks, rare. July—Oct. Per. *Plant* nearly smooth, 12 to 18 inches high. *Leaves* 3 to 5 inches long, ¾ to 1¼ inch wide, varying from lance-linear to lanceolate. *Spathe* veiny, 3 to 5-flowered. *Flowers* deep blue. *Stamens* 2, perfect.

2. C. VIRGINICA, L. *Virginian Day-flower.*

Stems upright, smooth; *leaves* lance-oblong, acuminate, the upper surface and margins rough backwards; *sheaths* fringed with rusty bristles; *spathes* crowded and nearly sessile, broadly dilated; *peduncle* several-flowered; *petals* nearly equal; *capsule* 3-celled.

Alluvial shaded river-banks. July, Aug. Per. *Stem* 1 to 2 feet high, erect. *Leaves* 5 to 7 inches long, 2 inches wide. *Spathe* broadly funnel-shaped. *Flowers* blue, clustered at the top of the stem. *Stamens* 3.

C. CŒLESTIS, with blue or white flowers is sometimes cultivated.

2. TRADESCANTIA, Linn. SPIDERWORT.

Named for *Tradescant*, gardner to Charles the First.

FLOWERS regular. SEPALS herbaceous. PETALS all alike, ovate, sessile. STAMENS 6, all fertile: FILAMENTS bearded. CAPSULE 2 to 3-celled, the cells 1 to 2-seeded.—*Herbaceous perennials, with keeled linear or lance-linear leaves, and ephemeral white purplish and rose-colored flowers in axillary and terminal umbelled clusters.*

1. T. VIRGINICA, L. *Common Spiderwort.*

Leaves lance-linear, elongated, tapering from the sheathing base to the point, ciliate; *umbels* terminal, many-flowered; *calyx* pubescent.

Moist shady woods, common in cultivation. May—Aug. *Stems* thick, round, jointed, 12 to 18 inches high. *Leaves* numerous, 12 to 18 inches long, by ½ to 1 inch wide. *Flowers* blue, in gardens often purplish or white, soon fading.

2. T. ROSEA, Vent. *Rose-colored Spiderwort.*

Small and slender, smooth; *leaves* linear, long, ciliate at the base; *umbel* simple or sometimes a pair; *calyx* smooth.

Moist woods or sandy fields, common. May. *Stem* 8 to 12 inches high. *Leaves* grass-like, 6 to 8 inches long, about ¼ inch wide. *Flowers* rose-colored, much smaller than in the preceding species.

ORDER 130. **XYRIDACEÆ.**—*Xyris Family.*

Rush-like herbs, with equitant leaves sheathing the base by a naked scape, which is terminated by a head of perfect 3-androus flowers, with extrorse anthers, a glumaceous calyx, and a regular corolla. FRUIT a 3-valved capsule containing many anatropous seeds;—chiefly represented by the genus.

XYRIS, Linn. Yellow-eyed Grass.

Gr. *xyros*, sharp, in allusion to the pointed leaves.

Perianth in 2 rows; outer row glumaceous, 2 of the segments boat-shaped or keeled; inner row petal-like, with claws, more or less coherent. Stamens 6, 3 fertile with linear anthers, and 3 sterile, plume-bearing. Style 3-cleft. Capsule oblong, free, 1-celled, with 3 parietal placentæ, 3-valved.—*Rush-like herbs, with narrowly linear rigid radical leaves, sheathing the scape, and yellow flowers in a terminal dense head.*

1. X. Caroliniana, Walt. *Common Yellow-eyed Grass.*

Scape flattish, somewhat 2-edged at the summit, 1-angled below, smooth; *leaves* linear-ensiform, flat; *head* globular-ovoid; *lateral sepals* obscurely torn-fringed above on the winged keel, rather shorter than the bract.

Wet meadows, rare. July, Aug. Per. *Scape* 1 to 2 feet high, somewhat bulbous at the base, often spirally twisted. *Leaves* few flat, 6 to 12 inches long, $\frac{1}{8}$ to $\frac{1}{4}$ inch wide. *Petals* rather large, yellow, the claws turning brownish.

2. X. brevifolia, Michx. *Short-leaved Yellow-eyed Grass.*

Leaves subulate, ensiform, short; *head* globose; *petals* shorter than the sepals slightly notched.

Wet meadows, rare. July. Per. *Scape* 12 to 18 inches high, compressed near the summit. *Leaves* much twisted. *Flowers* yellow.

Order 131. ERIOCAULONACEÆ.—*Pipewort Family.*

Aquatic or marsh plants, usually acaulescent, with linear cellular spongy leaves naked scapes sheathed at the base, and bearing dense heads of monœcious or diœcious minute flowers in the axils of minute bracts, with a double perianth, introrse anthers and a 2 to 3-celled 2 to 3-seeded capsule; principally represented by the genus

ERIOCAULON, Gronov. Pipewort.

Gr. *erion*, wool, and *kaulos*, a stalk; from the woolly scape of many species.

Flowers chiefly monœcious; the central ones of the head sterile, bearing 4 or 6 stamens, the exterior fertile. Sepals 2 or 3, the lateral ones boat-shaped. Corolla tubular and 2 to 3-lobed in the sterile flowers; of 2 or 3 sepals in the fertile, each bearing a black gland. Style 2 to 3-parted. Capsule 2 to 3-celled, loculicidal.—*Herbaceous plants, with smooth often pellucid leaves, simple scapes bearing a single head, the bracts and perianth whitened at the summit with a clothing of dense fine wool and the outer bracts scarious, often empty and forming a kind of involucre.*

E. septangulare, Withering. *Jointed Pipewort.*

Scape slender, 6 to 7-angled or furrowed; *leaves* subulate-ensiform, conspicuously cellular, pellucid; *outer bracts* obovate, rounded; *head* small, round.

Ponds and borders of swamps. Aug. Per. *Scape* 2 inches to 6 feet long, according to the depth of the water, pellucid and cellular. *Leaves* submersed, in a small tuft at the bottom, 1 to 3 inches by 1 to 2 lines, awl-pointed, tapering from a flattened base. *Head* lead color, ⅓ to ½ inch broad. *Stamens* 4.

SUB-CLASS IV. GLUMACEÆ, or GLUMACEOUS ENDOGENS.

Plants of the endogenous structure, with the flowers invested in an imbricated perianth of glumes instead of a calyx. OVARY with one cell containing a solitary ovule and becoming a 1-seeded achenium or caryopsis.

ORDER 132. CYPERACEÆ.—*Sedge Family.*

Grass-like or rush-like herbs, with fibrous roots and solid stems (culms), *closed sheaths, and spiked chiefly 3-androus flowers, one in the axil of each of the glume-like imbricated bracts, destitute of any perianth, or with hypogynous bristles or scales in its place, and a 1-celled ovary, with a single erect anatropous ovule, in fruit forming an achenium.* STYLE 2-cleft, when the fruit is flattened or lenticular, or 3-cleft when it is 3-angular.

1. DULICHIUM, Richard.

Gr. *duo*, two, *leikon*, a scale; alluding to the glumes in two rows.

SPIKELETS 6 to 10-flowered, linear, flattened, sessile in 2 ranks on axillary solitary peduncles emerging from the sheaths of the leaves. SCALES 2-ranked, lanceolate. PERIANTH of 6 to 9 downwardly barbed bristles. STAMENS 3. STYLE 2-cleft above. ACHENIUM flattened, linear-oblong, beaked with the long persistent style.—*Perennials, with short flat linear 3-ranked leaves, and round simple jointed culms, leafy to the summit.*

D. SPATHACEUM, Pers. *Spathaceous Dulichium.*

Borders of ponds, common. July—Sept. *Culm* 1 to 2 feet high. *Leaves* flat, spreading almost horizontally in three directions. *Spikelets* ¾ inch long, brownish, on a flexuous rachis. *Scales* rusty yellow.

2. CYPERUS, Linn. GALINGALE.

The ancient Greek name.

SPIKELETS many to few-flowered, disposed in a simple or compound terminal umbel. SCALES 2-ranked, deciduous with age. STAMENS 1, 2, or mostly 3. PERIANTH none. STYLE 2 to 3-cleft, deciduous. ACHENIUM lenticular or triangular, naked at the apex.—*Mostly perennials, with simple* *mostly triangular culms leafy at the base, 1 to several leaves at the summit forming an involucre to the umbel, and unequal peduncles sheathed at the base.*

SEC I. PYCREUS, Beauv.—*Style* 2-cleft: *achenium* flattened.

1. C. FLAVESCENS, L. *Yellow Sedge.*

Stamens 3; *spike* linear, rather obtuse, 14 to 30-flowered, clustered at the end of the 2 to 4 very short rays; *scales* obtuse, 1-nerved; *achenium* shining, orbicular.

Low grounds, rare. Aug. *Culms* 4 to 10 inches high. *Leaves* narrow, as long as the culm. *Spikelets* 5 to 8 inches long, yellowish. *Involucre* 3-leaved, very unequal.

2. C. DIANDRUS, Torr. *Diandrous Galingale.*

Stamens 2; *spikes* lance oblong, rather acute, 14 to 24-flowered, scattered or clustered on the 2 to 5 very short or unequal rays; *scales* oblong, rather obtuse, brown-margined; *achenium* oblong-ovate.

Low grounds. Aug., Sept. *Culms* 6 to 12 inches high, often weak and somewhat decumbent, clustered. *Stamens* sometimes 3 in the upper axils. Var. CASTANEUS, Torr., has oblong-lanceolate, shining close chestnut-brown scales, and scarcely exserted style.

3. C. CLEAVERII, Torr. *Delicate Galingale.*

Stamen 1; *culm* bristle-form, terminated by a single and similar erect involucral leaf and a solitary lance-linear 10 to 12-flowered spike; *scales* linear-oblong, rather acute, 3-nerved; *achenium* oblong-obovate.

Near Philadelphia, *Dr. Cleaver*. *Culm* 4 to 6 inches high, triangular. *Spike* ½ inch long much compressed.

SEC. II. CYPERUS proper.—*Style* 3-cleft. *Spikes* many-flowered. *Achenium* triangular.

* *Stamen* 1: *umbel contracted or sessile.*

4. C. INFLEXUS, Muhl. *Odorous Galingale.*

Dwarf, in tufts; *spikes* oblong-linear, about 8-flowered, collected in 2 or 3 ovate heads; *scales* oblong, tapering into a long recurved point; *involucre* 3-leaved, very long.

Sandy shores. Aug. Ann. *Culms* 2 to 5 inches high, densely clustered. *Leaves* linear, as long as the culm. *Umbel* often sessile. *Spikelets* yellowish. *Plant* sweet-scented like Melilot in drying.

* * *Stamens* 3: *culm triangular.*

5. C. STRIGOSUS, L. *Tall Galingale.*

Culm mostly stout, tuberous at the base; *umbel* simple or compound, many-rayed; *rays* numerous, elongated; *spikes* linear-lanceolate, flat, 8 to 10-flowered, very numerous; *scales* oblong-lanceolate, strongly nerved, acutish.

Low and cultivated grounds, very common. Aug., Sept. *Culm* 1 to 3 feet high. *Spikes* 1 to 2 inches long, consisting of 20 to 80 spikelets. *Scales* loosely imbricate, yellowish on the sides.

6. C. DENTATUS, Torr. *Toothed Galingale.*

Culm slender; *umbel* 4 to 7-rayed, compound; *spikes* 3 to 6 on each partial ray, clustered, oblong or ovate-lanceolate, flat, 6 to 30-flowered; *scales* strongly keeled, with very acute tips; *joints* of the axis naked; *achenium* obovate, minute.

Sandy swamps. Aug. *Rhizoma* creeping. *Culm* 6 to 12 inches high. *Leaves* somewhat rigid, pale yellowish-green. *Scales* reddish brown on the sides, green on the back.

7. C. FILICULMIS, Vahl. *Slender-stalked Galingale.*

Culm slender, wiry, often reclined; *spikes* numerous and clustered in a dense head, or in 1 to 3 additional looser heads on spreading rays, 6 to 10-flowered; *scales* ovate, blunt, loose; *achenium* obovate.

Dry sterile soil. Aug. *Culm* 1 foot high, clustered, tuberous at base. *Leaves* linear, dull green. *Scales* yellowish green, with a scarious margin.

*** *Inner scales herbaceous, free.*

8. C. ERYTHROHIZOS, Muhl. *Red-rooted Galingale.*

Culm obtusely triangular; *umbel* compound, many-rayed; *involucre* 4 to 5-leaved, very long; *spikes* very numerous, crowded in oblong-cylindrical heads, 10 to 18-flowered; *scales* lanceolate, mucronate.

Wet alluvial banks. Aug. *Culm* 2 to 3 feet high, smooth. *Leaves* shorter than the culm. *Spikes* bright chestnut colored. *Root* fibrous, red.

3. HEMICARPHA, Nees.

Gr. *hemi*, half, and *karphos*, straw or chaff, in allusion to the single inner scalelet on one side of the flower.

SPIKE many-flowered, ovoid, one or few in a lateral cluster, sessile. SCALES imbricated in many ranks, ovate or obovate. INNER SCALE single behind the flower, very thin. PERIANTH none. STAMEN 1. STYLE 2-cleft.—*Low tufted annuals; the naked culms with bristle-like leaves at the base.*

H. SUBSQUARROSA, Nees. *Dwarf Hemicarpha.*

Dwarf; *involucre* 2-leaved, 1 long as if a continuation of the bristle-like culm, the other a minute leaf; *spikes* 2 or 3; *scales* tipped with a short-recurved point.

Sandy shores. July. *Culms* 1 to 4 inches high, in dense tufts, leafy at base. *Leaves* setaceous. *Spikes* ¼ inch long, sometimes solitary. *Scales* very numerous.

4. ELEOCHARIS, R. Brown. SPIKE-RUSH.

Gr. *elos*, a marsh, and *charis*, to delight in; being marsh plants.

SPIKE single, terminating the naked culm, many to several-flowered. SCALES imbricated on all sides in many, rarely 2 or 3 ranks. PERIANTH of 3 to 12 (usually 6) bristles, often rough or barbed downwards. STAMENS 3. STYLE 2 or 3-cleft, bulbous at the base, jointed with the apex of the lenticular or mostly obtusely triangular achenium.—*Chiefly perennial leafless herbs, with tufted culms sheathed at the base, some of them often sterile from matted or creeping rootstocks.*

1. E. QUADRANGULATA, R. Brown. *Square-stalked Spike-rush.*

Culm even, sharply 4-angled, 3 of the sides concave, the fourth wider and flat; *scales* broad-ovate, very obtuse; *achenium* smooth, crowned with a beaked tubercle

Shallow water. Aug. *Culm* 2 to 4 feet high, with purple sheaths at base. *Spike* 1 to 1¼ inch long. *Scales* with a scarious margin, dotted with purple.

2. E. OBTUSA, Schultes. *Obtuse Spike-rush.*

Culms nearly terete, tufted; *spike* globose-ovoid, many-flowered; *scales* very numerous (80 to 130), densely crowded in many ranks; *style* 3-(rarely 2)-cleft *achenium* obovate, shining, tumid-margined, about half the length of the 6 bristles, crowned with a broad tubercle.

Muddy places, very common. July. *Culms* 8 to 15 inches high. *Spike* thick and obtuse. *Scales* with a green midrib.

3. E. PALUSTRIS, R. Brown. *Common Spike-rush.*

Culms nearly terete, striate, rising from running rootstocks; *spikes* oblong-lanceolate, pointed, many-flowered; *scales* ovate-oblong, loosely imbricated in several ranks; *achenium* obovate, somewhat shining, crowned with a flattened tubercle, shorter than usually 4 bristles.

Marshes and low meadows, common. June—Aug. *Culm* 1 to 2 feet high, stout and tall when growing in the water, or slender and lower when in grassy grounds. A very variable species. *Spike* ¼ to ½ inch long. *Scales* reddish-brown, with a broad and translucent whitish margin and green keel.

4. E. INTERMEDIA, Schultes. *Intermediate Spike-rush.*

Culms capillary, wiry, striate-grooved, densely tufted from fibrous roots, diffusely spreading or reclining; *spike* oblong ovate, acutish, loosely 10 to 18-flowered; *scales* oblong, obtuse, green-keeled, the sides purplish-brown; *achenium* smooth, obovoid, tubercled, nearly equalling the 6 bristles.

Wet slopes, common. July. *Culms* very numerous, 6 to 12 inches high. *Achenium* light brown.

5. E. TENUIS, Schultes. *Slender Spike-rush.*

Culms almost capillary, erect, sharply 4-angular, the sides concave; *spike* elliptical, acutish, 20 to 30-flowered; *scales* ovate, obtuse, chestnut-purple with a broad scarious margin and green keel; *achenium* obovate, roughened; *bristles* 2 to 3, half the length of the achenium, or wanting.

Wet meadows and bogs, common. July. *Culm* 8 to 12 inches high, very slender, with 1 or 2 purple sheaths at base. *Spike* ¼ inch long.

6. E. ACICULARIS, R. Brown. *Capillary Spike-rush.*

Culms finely capillary, 4-angular; *spike* 3 to 8-flowered; *scales* ovate-oblong, rather obtuse, greenish with purple sides; *achenium* obovate-oblong, rather acute at each end, tumid, with 3-ribbed angles, longer than the 3 or 4 very fugaceous bristles.

Muddy places, and margins of brooks, common. June—Aug. *Culm* 2 to 8 inches long, clustered, slender.

5. SCIRPUS, Linn. BULRUSH. CLUB-RUSH.

The ancient Latin name of the Bulrush.

SPIKES many or several-flowered, terete, mostly clustered, often appearing lateral from the extension of the involucral leaf like a continuation of the culm. SCALES regularly imbricate on all sides in several ranks. PERIANTH of 3 to 6 bristles. STAMENS 3. STYLE 2 or 3-cleft, simple at base, deciduous. ACHENIUM lenticular or triangular.—*Chiefly perennials, with the culms sheathed at the base, sheaths usually leaf-bearing, and solitary conglomerated or corymbose spikes.*

SEC. I. SCIRPUS proper.—*Bristles* rigid, mostly barbed downwards.

1. S. PLANIFOLIUS, Muhl. *Flat-leaved Club-rush.*

Culms triangular, loosely tufted, leafy at the base; *leaves* linear, flat, as long as the culm, rough on the edges and keel; *spike* ovate or oblong, 5 to 7-flowered, rusty color; *scales* ovate, with a strong green keel prolonged into an awned tip; *bristles* 4 to 6, upwardly hairy, as long as the blunt achenium.

Dry or moist woods, rare. June. *Culms* 6 to 12 inches long, rough on the edges. *Scales* yellowish.

2. S. PUNGENS,, Vahl. *Pungent Club-rush.*

Culm sharply 3-angled throughout, with concave sides; *leaves* 1 to 3, elongated, keeled and channelled; *spikes* 1 to 6, capitate, ovoid, long, overtopped by the pointed involucral leaf; *scales* ovate, sparingly ciliate, 2-cleft at the apex; *anthers* tipped with a minute fringed appendage; *style* 2-cleft; *bristles* 2 to 6, shorter than the obovate smooth achenium.

Borders of fresh ponds and streams. July, Aug. *Culm* 1 to 4 feet high. *Leaves* 4 to 10 inches long. This is the species used for rush-bottom chairs.

3. S. LACUSTRIS, L. *Bulrush. Tall Club-rush.*

Culm large, cylindrical, gradually tapering at the apex; *spikes* ovate-oblong, numerous in a compound umbel-like panicle, turned to one side, rusty brown; *scales* ovate, mucronate; *bristles* 4 to 6; *achenium* obovate, mucronate.

Fresh water ponds and lakes. July. *Culm* 3 to 8 feet high, ½ inch thick at the base, tipped with an erect pointed involucral leaf, shorter or longer than the panicle. *Scales* brown, minutely pubescent.

4. S. DEBILIS, Pursh. *Weak-stalked Club-rush.*

Culms slender, tufted from fibrous roots, leafless, sometimes 1-leaved at the base *spikes* ovate, 1 to 8 in a sessile cluster; *scales* round-ovate, greenish-yellow; *style* 2 to 3-cleft; *bristles* 4 to 6, longer than the obovate shining achenium.

Low grounds, and banks of streams. Aug. Ann. *Culms* 6 to 12 inches high. *Spikelets* apparently bursting from the side of the culm 2 or 3 inches from the top. *Bristles* retrorsely hispid.

5. S. ATROVIRENS, Muhl. *Dark-green Club-rush.*

Culm rigid, obtusely triangular, very leafy; *leaves* broadly linear, flat, rough margined; *umbel* cymose-decompound, irregular, the numerous spikes clustered 15 to 20 together in dense heads; *bristles* 6, scarcely exceeding the obovoid compressed achenium.

Low grassy ground, common. July. *Culm* about 2 feet high, leafy nearly to the top, smooth. *Spikes* ovoid, dark-lead-colored or olive-green, turning brownish. *Involucre* of 3 principal leaves, dark-green.

SEC. II. TRICHOPHORUM, Richard.—*Bristles* 6, capillary, tortuous, smoothish. *Stem* leafy.

6. S. LINEATUS, Michx. *Loose-flowered Wool-grass.*

Culm triangular, leafy; *leaves* linear, flat, rough on the margins; *umbels* terminal and axillary, loosely cymose-panicled, drooping, the terminal with a 1 to 3-leaved involucre; *spikes* oblong, becoming cylindrical, on filiform pedicels; *scales* ovate, pointed with a green keel.

Low grounds. July. *Culm* 1 to 3 feet high. *Bristles* crisped, scarcely exceeding the scales.

7. S. ERIOPHORUM, Michx. *Wool-grass.*

Culm nearly terete, very leafy; *leaves* narrowly linear, long, rigid; *panicle* decompound, large, loose; *spikes* ovate, clustered on the lateral pedicels, woolly at maturity; *bristles* rusty-colored, much longer than the pointless scales; *achenium* short-pointed.

Wet meadows, common. July, Aug. A somewhat variable species 2 to 5 feet high, leafy near to the top. *Leaves* 1 to 2 feet long, flat above, rough on the margin. *Scales* with the sides brown and the keel green.

6. ERIOPHORUM, Linn. COTTON-GRASS.

Gr. *erion*, wool or cotton, and *phora*, bearing.

SPIKE many-flowered. SCALES imbricated all round in several ranks. PERIANTH woolly, of numerous flat hairs, much longer than the scales, persistent and forming a silky or cotton-like usually white tuft in fruit. STAMENS 3. STYLE 3-cleft.—*Perennials, with mostly leafy stems, and mostly umbelled spikelets, finally clothed with long silky hairs.*

1. E. VIRGINICUM, L. *Virginian Cotton-grass.*

Culm rigid, nearly terete below, obtusely triangular above; *leaves* narrowly-linear, elongated, flat: *spikes* crowded in a dense cluster or head; *wool* rusty-color, 3 times the length of the scale; *stamen* 1.

Bogs and low meadows, common. July, Aug. *Culm* 2 to 4 feet high, leafy. *Scales* with pale sides and a green keel. *Hairs* very numerous, tawny.

2. E. POLYSTACHYON, L. *Broad-leaved Cotton-grass.*

Culm rigid, obscurely triangular; *leaves* linear flat, or barely channelled below, triangular at the point; *involucre* 2 or 3-leaved; *spikes* several, on nodding peduncles, some of them elongated in fruit.

Bogs and marshes, common. June, ripe in Aug. A variable species. *Culm* 1 to 2 feet high, smooth. *Scales* green, at length brown. *Hairs* very numerous, long, white with a reddish tinge, 1 inch long.

7. FIMBRISTYLIS, Vahl.

Lat. *fimbria*, a fringe, and *stylus*, a style; from the ciliate style.

SPIKES several to many-flowered. SCALES regularly imbricated in several ranks. BRISTLES none. STAMENS 1 to 3. STYLE 2 or 3-cleft, with a thickened or bulb-like base, deciduous.—*Perennials with leafy culms, and cymose-umbelled spikes*, as in Scirpus.

SEC. I. FIMBRISTYLIS proper.—*Style* 2 cleft, mostly flat and ciliate on the margin.

1. F. LAXA, Vahl.

Culms grooved and flattish, slender: *leaves* chiefly from the base, narrowly-linear, flat, channelled, ciliate-denticulate, glaucous: *umbel* simple or compound; *involucre* about 3-leaved; *spikes* ovate, acute; *stamen* single; *achenium* 6 to 8-ridged on each side.

Low clayey soil. July, Aug. *Culm* 4 to 12 inches high. *Umbel* small, some of the rays divided. *Spikes* ¼ inch long.

SEC. II. TRICHELOSTYLIS, Lestib. *Style* 3-cleft, separating from the triangular achenium.

2. F. AUTUMNALIS, Roem. & Schultes.

Low, tufted; *culms* flat, often diffusely spreading; *leaves* flat, very acute; *in*-

volucre 2-leaved; *umbel* usually decompound; *spikes* oblong, acute, single or 2 or 3 together at the end of the rays; *stamens* 2 or 3; *achenium* obovate-triangular.

Muddy grounds. Aug.—Oct. *Culm* 8 to 12 inches high. *Leaves* mostly radical. *Scales* rusty brown with a green keel.

3. F. CAPILLARIS, Gray. *Capillary Fimbristylis.*

Low, densely tufted; *culms* capillary, much longer than the bristle form leaves; *sheaths* hairy at the throat; *involucre* 2 or 3-leaved; *umbel* compound or cymose-panicled; *spikes* ovoid oblong; *stamens* 2; *achenium* very obtuse, tipped with the minute bulb.

Sandy fields, common. Aug. *Culm* 3 to 8 inches high. *Leaves* mostly radical. *Scales* rusty brown with a green keel.

8. CERATOSCHŒNUS, Nees. HORNED RUSH.

Gr. *keras*, a horn, and *schoinos*, a rush.

SPIKES 2 to 5 flowered, one perfect, and 1 to 4 staminate. SCALES few and loosely imbricated, the lower empty. PERIANTH of 5 or 6 rigid or cartilaginous bristles. STAMENS 3. STYLE simple, entirely hardening into a long beak with a narrow base, much exserted, and several times longer than the flat and smooth achenium.—*Perennials, with triangular leafy culms and large spikes clustered in simple or compound terminal and capillary cymes.*

1. C. CORNICULATA, Nees.

Cymes decompound, diffuse; *bristles* awl shaped, stout, unequal, shorter than the achenium.

Wet places. Aug. *Culm* 3 to 6 feet high, triangular. *Leaves* 12 to 13 inches long, ½ inch wide. *Fruit* with the beak 1 inch long.

9. RHYNCHOSPORA, Vahl. BEAK RUSH.

Gr. *rugchos*, a snout, and *spora*, a seed; from the beaked achenium.

SPIKE ovate, few to several-flowered. SCALES loosely imbricate, the lower ones smaller and empty. BRISTLES 6, rarely more. STAMENS mostly 3. STYLE 2-cleft. ACHENIUM lenticular or globular, crowned with the persistent base of the style.—*Perennials, with more or less triangular leafy culms, and small spikes in terminal and axillary clusters, cymes or heads.*

1. R. CYMOSA, Nutt. *Tufted Beak-rush.*

Culm triangular; *leaves* linear, flat; *cymes* corymbose; *spikes* crowded and clustered; *achenium* round-obovate, twice the length of the bristles.

Low grounds, rare. July, Aug. *Culm* 12 to 15 inches high, slender.

2. R. ALBA, Vahl. *White Beak-rush.*

Culm triangular above; *leaves* nearly bristle-form; *spikes* several corymb-clustered, lanceolate; *stamens* usually 2; *achenium* ovoid, narrowed at the base, shorter than the 9 to 11 bristles.

Bogs and swamps, common. July, Aug. *Culm* slender, 12 to 20 inches high, smooth. *Spikelets* about 2-flowered. *Scales* lanceolate, whitish, when old brownish.

3. R. CAPILLACEA, Torr. *Capillary Beak-rush.*

Culm triangular, slender; *leaves* bristle-form; *spikes* 3 to 6 in a terminal cluster, and mostly 1 or 2 on a remote axillary peduncle; *achenium* oblong-ovoid, stipitate, about half the length of the 6 stout bristles.

Bogs and rocky river-banks. July. *Culm* 6 to 9 inches high. *Spikelets* 1 to 3-flowered. *Scales* light-brown, oblong, mucronate.

4. R. GLOMERATA, Vahl. *Clustered Beak-rush.*

Culm obtusely triangular; *leaves* linear, flat; *spikes* very numerous in distant clusters or heads, ovoid-oblong; *achenium* obovate, margined, narrowed at the base; *bristles* 6, downwardly barbed.

Low grounds. Aug. *Culm* 1 to 2 feet high, smooth. *Leaves* flat, shorter than the culm. *Scales* lanceolate, brownish.

10. CLADIUM, P. Browne. TWIG-RUSH.

Gr. *klados*, a twig or branch, application uncertain.

SPIKES ovoid or oblong. SCALES few, imbricate in a somewhat trifarious manner; the lowest empty. BRISTLES none. STAMENS 2. STYLE 2 or 3-cleft, deciduous. ACHENIUM ovoid or globular.—*Perennials, with leafy stems and terminal and axillary corymbs or panicles.*

C. MARICOIDES, Torr. *Smooth Twig-rush. Bog-rush.*

Culm obscurely triangular; *cymes* small, compound; *spikes* clustered in heads of 3 to 8 together on 2 to 4 peduncles; *style* 3-cleft, with entire lobes.

Bogs and ponds. July. *Culm* 2 feet high, nearly smooth. *Leaves* channelled, with a long compressed point. *Scales* about 6, brown; 4 lower ones usually empty.

11. SCLERIA, Linn. NUT-RUSH.

Gr. *skleria*, hardness; from the bony or crusted fruit.

FLOWERS monœcious. FERTILE SPIKES 1-flowered, usually intermixed with clusters of few-flowered staminate spikes. SCALES loosely imbricated, the lower empty. STAMENS 1 to 3. STYLE 3-cleft. ACHENIUM globular, seated in a shallow or saucer-shaped disk.—*Perennials, with triangular leafy culms, and fascicled or panicled spikes.*

SEC. I. SCLERIA proper.—*Perianth* lobed or a ring, often obscure.

1. S. TRIGLOMERATA, Michx. *Three-clustered Nut-rush.*

Culm broadly-linear leaves roughish; *fascicles* of spikes few, terminal and axillary, in triple clusters, the lower peduncled; *stamens* 3; *achenium* ovoid-glubular, slightly pointed.

Low grounds. June, July. *Culm* 2 to 3 feet high, leafy. *Leaves* 2 to 3 lines wide, rough on the margin. *Scales* purplish. *Achenium* large and white.

2. S. PAUCIFLORA, Muhl. *Few-flowered Nut-rush.*

Somewhat downy or nearly smooth; *leaves* narrowly linear; *clusters* few-flowered;

bracts ciliate; *scales* smoothish; *tubercles* of the perianth in 3 pairs at the base of the shining roughened achenium.

Swamps and hills. July. *Culm* 9 to 18 inches high, roughish above. *Fascicles* 2 or 3; the lower lateral ones when present peduncled. *Achenium* white, rough with elevated points.

Sec. II. Hypoporum, Nees. *Perianth* none: *stamens* 1 or 2.

3. S. verticillata, Muhl. *Whorled Nut-rush.*

Smooth; *culm* simple, slender and with the linear leaves smooth; *fascicle* 4 to 6, alternate, sessile, distant; *bracts* minute, setaceous; *scales* smooth; *achenium* globose, rough-wrinkled, short-pointed.

Swamps. June—Aug. *Culm* 6 to 10 inches high, very slender, terminated by an interrupted spike or fascicle of 4 to 6 rather distant sessile clusters. *Scales* purple.

12. CAREX, Linn. Sedge.

A classical name of obscure signification.

Spikes one or several, androgynous, monœcious or rarely diœcious. Scales of the spikes 1-flowered, equally imbricated around the axis. Stamens 3, rarely 2. Style single, included: stigmas 2 or 3, elongated, exserted. Ovary inclosed in an inflated sac (perigynium). Achenium lenticular, plano-convex or triangular, crowned with the lower portion of the style.—*Perennial herbs, chiefly flowering in April or May, often growing in wet places, with triangular culms, grassy leaves usually rough on the margins and keel, and bearing the spikes in the axils of green and leaf-like or scale-like bracts.*

Sec. I. *Spikes* staminate at the summit.

* *Stigmas* 3.

1. C. polytrichoides, Muhl. *Bristle-stalked Sedge.*

Culm slender; *leaves* very narrow, shorter than the culm; *spike* very small, few-flowered; *perigynia* erect, alternate, oblong, obtuse, slightly nerved, entire at the apex, green, twice the length of the ovate scale.

Low grounds and bogs, common. *Culm* a foot high, very slender. *Fertile flowers* 3 to 8.

2. C. pedunculata, Muhl. *Peduncled Sedge.*

Spikes about 4, on long peduncles, very remote; *sheaths* with green tips much shorter than the stalks; *perigynia* with a long attenuated base, the orifice minutely notched, a little longer than the dark purple scale.

Dry woods and rocky hillsides, rare. *Culms* 4 to 10 inches high, tufted, prostrate at maturity.

3. C. umbellata, Schk. *Umbelled Sedge.*

Tufted; *culms* very short; *staminate spike* short, erect, sometimes with a few pistillate flowers; *fertile spikes* 4 or 5, ovoid, few-flowered, the uppermost close to the sterile spike and sessile, the rest on radical peduncles of about an unequal height; *perigynia* ovoid, 3-angled, acuminate.

Rocky hillsides. *Culms* in dense tufts 2 to 6 inches high. *Leaves* radical, narrow, rough, longer than the culm.

4. C. PENNSYLVANICA, Lam. *Pennsylvanian Sedge.*

Sterile spikes erect, commonly on a short stalk; *fertile spikes* usually 2, approximate, nearly sessile, ovoid, 4 to 6-flowered; *perigynium* roundish-ovoid, with a short and abrupt minutely-toothed beak about the length of the ovate pointed chestnut-colored scale.

Dry woods and hillsides, common. *Culms* tufted, 4 to 12 inches high, slender, rough above. *Leaves* short, somewhat glaucous.

5. C. VESTITA, Willd. *Short Woolly Sedge.*

Sterile spikes 1 or 2, the uppermost cylindrical, short-stalked: *fertile spikes* 1 or 2, approximate, sessile, ovoid or oblong; *perigynia* ovoid, downy, nerved, short-beaked, a little longer than the ovate pointed scale.

Sandy soils, rare. *Culms* about 2 feet high, tufted. *Leaves* flat, shorter than the culms, rough.

6. C. TENTACULATA, Muhl. *Long-pointed Sedge.*

Sterile spikes solitary: *fertile spikes* 2 or 3, ovoid, oblong, or cylindrical, densely flowered, approximate and diverging horizontally: *perigynia* crowded, ovoid, inflated, very long-beaked, 2-toothed at the apex, longer than the long-subulate scale.

Wet meadows, common. *Culm* 12 to 18 inches high, triangular, rough on the angles. *Leaves* bright green, longer than the culm.

7. C. INTUMESCENS, Rudge. *Swollen Sedge.*

Sterile spikes oblong, peduncled; *fertile spikes* 1 or 2, ovoid, loosely 5 to 8-flowered, closely approximated, sessile, or the lower on a very shortly exserted peduncle; ***perigynia*** ovoid, erect-spreading, tapering into a long beak, much longer than the ovate cuspidate scale.

Wet grounds, common. *Culm* slender, 15 to 20 inches high, with 1 to 3 fertile spikes closely crowded together. *Leaves* broad-linear, rough on the margin.

8. C. FOLLICULATA, L. *Tall Yellow Sedge.*

Sterile spike solitary, small, short-stalked, or sessile: *fertile spikes* 3 or 4, ovoid, very remote, the lower on exserted peduncles; *perigynia* erect-spreading, tapering to a long point, exceeding the ovate white long-awned scale.

Swamps. *Culm* 2 to 4 feet high, leafy. *Leaves* flat, smooth, ⅓ inch wide, yellowish. *Bracts* long, foliaceous.

9. C. LUPULINA, Muhl. *Hop-like Sedge.*

Sterile spikes short-peduncled; *fertile spikes* 2 or 3, oblong-ovoid, erect, the upper approximate, the lower on more or less exserted stalks; *perigynia* erect, inflexed, long-beaked, much longer than the lanceolate awned scale. Var. 1. PEDUNCULATA, Beck. *Fertile spikes* all peduncled, distant; the 3 upper subumbellate.

Swamps and wet meadows, not common. A coarse robust species 2 to 3 feet high, with very thick culms, long bright green leaves, and very thick spikes 2 or 3 inches in length.

10. C. VESICARIA, L.

Staminate spikes 2 or 3; *fertile spikes* mostly 2, oblong, or cylindrical, stout, approximate, the upper sessile, the lower on a short rough stalk; *perigynia* oblong-ovoid, 17-nerved at base, 10-nerved above, with a short tapering beak, broader than the long pointed scale.

Marshes, rare. Chester County, Darlington. A bright green plant about 2 feet high. *Culm* sharply angled and rough, shorter than the leaves.

11. C. SCABRATA, Schweinitz. *Rough Sedge.*

Fertile spikes 4 or 5, cylindrical, erect, rather distant, densely flowered, the lower on long stalks; *bracts* without sheaths; *perigynia* ovoid, contracted at the base, few-nerved, rough with an oblique notched beak, longer than the ovate brown scale.

Wet meadows and swamps. *Culm* 18 inches high, and with the dark green leaves and bracts very rough.

12. C. DEBILIS, Michx. *Weak Sedge.*

Sterile spikes solitary, occasionally fertile at the apex; *fertile spikes* with loose alternate flowers, on a somewhat zigzag rachis; *perigynia* oblong, tapering at each end twice as long as the ovate-lanceolate awned scales.

Moist meadows. June. *Culm* 1 to 2 feet high, weak and slender, sometimes procumbent, leafy. *Leaves* narrow.

13. C. OLIGOCARPA, Schk. *Few-fruited Sedge.*

Sterile spike solitary, pedunculate; *fertile spikes* small, 3 to 8-flowered; *style* very short, thickened towards the base; *perigynium* roundish-triangular, with a slightly oblique point.

Woods. *Culm* 6 to 12 inches high, erect. *Leaves* longer than the culm, rough on the edge, dark green. *Sheaths* smooth.

14. C. PLANTAGINEA, Lam. *Plantain-like Sedge.*

Sterile spike solitary, pedunculate; *fertile spikes* mostly 4, oblong, 5 to 8-flowered; *bracts* very short, dark purple or the lowest greenish at the apex; *perigynia* oblong, acute at each end, recurved at the apex.

Shady woods. *Culm* 8 to 20 inches high, erect. *Leaves* radical, broad, strongly 3-nerved.

15. C. GRANULARIS, Muhl. *Round-fruited Sedge.*

Sterile spike sessile, or short-stalked, occasionally bearing a few fertile flowers; *fertile spikes* 3 or 4, cylindrical, densely flowered, remote, the 2 lowest peduncled; *perigynia* roundish-ovoid, nerved, minutely pointed; *bracts* longer than the culm.

Wet meadows, common. *Culm* 10 to 15 inches high, erect or somewhat decumbent.

16. C. ANCEPS, Willd. *Pale Sedge.*

Sterile spike solitary, triangular; *fertile spikes* 2 to 4, slender, loosely flowered; *perigynia* ovoid, narrowed at each end. Var. 1. STRIATULA has the spikes oblong, more densely flowered, and the perigynia obovoid with a shorter point. (C. blanda, Dew.)

Open woods, common. *Culm* 6 to 12 inches high, triangular, leafy near the base. *Leaves* as long as the culm, pale-green and somewhat glaucous.

17. C. BULLATA, Schk. *Inflated Sedge.*

Sterile spikes 2 or 3; *fertile spikes* 1 or 2, mostly 1, approximated, oblong or cylindrical, stout, sessile or on short smooth stalks; *perigynia* spreading, ovoid, long-beaked, twice as long as the lanceolate scale.

Wet meadows. *Culm* 1½ to 2½ feet high, triangular, rough above, leafy. *Bracts* and *leaves* narrow, about as long as the culm.

18. C. HYSTERICINA, Willd. *Porcupine Sedge.*

Sterile spike solitary; *fertile spikes* 2 to 4, oblong-cylindrical, densely flowered, the uppermost nearly sessile, the lower on long stalks, at length nodding; *perigynia* ovoid, inflated, spreading, many-nerved, beaked, twice as long as the oblong awned scales.

Wet meadows. A pale or yellowish-green plant, 1 to 2 feet high. *Leaves* long, linear-lanceolate. *Fertile spikes* ¾ to 1½ inch long.

** Stigmas 2. Spikelets mostly sterile at the summit.*

19. C. BROMOIDES, Schk. *Brome-like Sedge.*

Spikes 4 to 6, alternate, oblong-lanceolate, some of the central ones wholly fertile; *perigynia* erect, narrow-lanceolate, with a tapering point, longer than the lanceolate scale; *style* jointed at the base.

Swampy grounds, common. *Culm* 12 to 18 inches high, slender, rough above. *Scale* light brown. Occasionally diœcious.

20. C. VULPINOIDEA, Michx. *Fox Sedge.*

Spike oblong and dense, or more or less interrupted, of 8 to 10 crowded clusters; *perigynia* ovate from a broad base, with a more or less abrupt beak, diverging at maturity; *scale* ovate, cuspidate.

Low grounds, common. *Culm* 18 to 24 inches high, obtusely triangular above, leafy. *Spikes* 1½ to 2½ inches long.

21. C. STIPATA, Muhl. *Beaked Sedge.*

Spikes 10 to 15 aggregated, or the lower ones distinct and sometimes compound; *perigynia* lanceolate, with a long beak tapering from a truncate base, longer than the scale.

Swamps and low grounds, common. *Culm* 1 to 3 feet high, thick and succulent. *Spike* 2 inches long, straw color.

22. C. ROSEA, Schk. *Rose Sedge.*

Spikes 4 to 6, the uppermost approximate, the others all distinct and the lowest often remote; *perigynia* oblong, 8 to 10 in each spike, narrow at the base, rough on the margin, twice as long as the ovate obtuse scale.

Moist woods and meadows, common. *Culm* 12 to 15 inches high. *Spikes* yellowish-green. Varies with weak slender culms, and small 3 to 4 flowered spikes.

23. C. RETROFLEXA, Muhl. *Retroflexed Sedge.*

Spikes 4 or 5, all approximate, the 1 or 2 lowest distinct but not remote; *perigynia* about 5 to 7 in each spike, ovate or ovate-lanceolate, smooth on the margin, spreading or reflexed, not much exceeding the ovate-lanceolate pointed scale.

Moist meadows and pastures. *Culm* 12 to 15 inches high, slender.

24. C. CEPHALOPHORA, Muhl. *Oval-headed Sedge.*

Spikes 5 or 6, small, and densely aggregated into a short ovoid head; *perigynia* broadly ovate, with 2 or 4 distinct nerves on the outer side, scarcely longer than the ovate roughly-pointed scale; *achenium* roundish ovate; *style* short tumid at the base.

Woods and fields, common. *Culm* 1 to 2 feet high, leafy at base. Whole plant green.

25. C. CAESPITOSA, L. *Smaller Bog Sedge.*

Sterile spikes solitary or sometimes 2, cylindrical-oblong; *fertile spikes* mostly 3, cylindric, obtuse, distant, the lower on a short exsert peduncle; *perigynium* ovoid or oval, somewhat acute, smooth, mostly longer than the oblong obtuse blackish scale.

Mountain bogs. *Culm* 12 to 18 inches high, slightly round above. *Leaves* flat, light green. Beck.

26. C. CRINITA, Lam. *Fringed Sedge.*

Sterile spikes 1 or 2, often with fertile flowers variously intermixed; *fertile spikes* 3 to 5, long-cylindrical, densely flowered, on exserted nodding stalks; *bracts* longer than the culm; *perigynia* roundish-obovate, slightly inflated, obscurely nerved, shorter than the oblong light-brown scale.

Wet meadows and borders of rills, common. *Culm* 2 to 4 feet high, sharply angled, with pale leaves about ¼ inch wide. *Fertile spikes* 2 to 3 inches long.

27. C. STRICTA, Lam.

Sterile spikes 1 to 3; the *fertile* 2 to 4, cylindrical, slender, usually barren at the summit, sessile or the lower on a short stalk; *lower bracts* auricled, seldom exceeding the culm; *perigynia* ovate acuminate or elliptical, with a short, entire, or slightly notched point, usually shorter and broader than the reddish-brown scale.

Wet meadows and swamps, common. *Culm* 2 to 2½ feet high, slender sharply triangular, rough. *Leaves* shorter than the culms, narrow, rigid, rough and glaucous. Grows in large thick tufts.

28. C. ALOPECOIDEA, Tuckerman. *Fox-tail Sedge.*

Head of 8 to 10 aggregated spikes, oblong, dense; *perigynia* compressed, obscurely nerved, ovate, somewhat longer than the scale; *achenium* pyriform.

Woods not common. *Culm* 2 to 3 feet high, rough on the angles. *Spike* yellowish-green.

Sec. II. *Spikes* pistillate at the summit.

* *Stigmas* 2.

29. C. FRASERI, Sims. *Fraser's Sedge.*

Spike simple, ovoid; *perigynium* ovoid-subglobose, entire at the point, striate, longer than the oblong scale.

Mountains. *Culm* about a foot high, sheathed at base. *Leaves* radical, broad, wavy. *Beck.*

30. C. STELLULATA, Good. *Star-like Sedge.*

Spikes 3 to 5, distinct, obovoid or roundish at maturity; *perigynia* ovate, acuminate, scabrous on the margin, at length spreading horizontally, longer than the ovate acute scale; *achenium* oblong or ovate; *style* slightly tumid at the base. (C. scirpoides, *Schk.*)

Swamps and wet meadows, common. *Culm* 8 to 18 inches high, stiff, leafy below. A variable plant embracing several nominal varieties, some of which occasionally bear diœcious spikes.

31. C. SCOPARIA, Schk. *Broom-like Sedge.*

Spikes 5 to 8, club-shaped, at length ovate, more or less approximate, sometimes forming a dense head; *perigynia* narrowly lanceolate, tapering into a long slender beak, longer than the lanceolate pointed scale.

Low meadows, common. *Culm* 1 to 2 feet high, triangular rough above. *Leaves* long and narrow. *Spike* brownish or straw colored when ripe.

32. C. LAGOPODIOIDES, Schk. *Hare's-foot Sedge.*

Spike 10 to 15, approximate, alternate and sessile; *perigynia* ovate-lanceolate, twice as long as the ovate-lanceolate scale; *achenium* narrowly oval, on a short stalk. Var. CRISTATA has the spikes closely aggregated, with the perigynia spreading.

Wet fields, common. *Culm* 1 to 2½ feet high, furrowed. *Spike* sub-cylindric when young.

33. C. STRAMINEA, Schk. *Straw-colored Sedge.*

Spikes about 6, roundish-ovoid, approximate; *perigynia* orbicular-ovate, much compressed, broadly and membranaceously winged, somewhat longer than the lanceolate scale; *achenium* sessile, oval.

Wet meadows, borders of woods and fields. A variable species, including several nominal species.

** *Stigmas* 3.

34. C. SHORTIANA, Dew. *Short's Sedge.*

Spikes about 5, cylindrical, erect, more or less distant, and the lowest rather remote, all androgynous and densely flowered; *perigynia* broadly-obovate, abruptly contracted at the base into a short stalk, but little longer than the short-pointed somewhat obovate scale.

Marshes, Southern parts of the State.

35. C. MILIACEA, Muhl. *Millet-like Sedge.*

Sterile spike solitary, pedunculate; *fertile spikes* 3, slender, cylindrical, on filiform nodding peduncles; *perigynia* ovoid triangular, slightly beaked, entire at the orifice, as long as the ovate-lanceolate scale.

Wet meadows. *Culm* 1 to 2 feet high, slender, leafy below. *Leaves* narrow, about as long as the culm, yellowish-green.

36. C. SQUARROSA, L. *Squarrose Sedge.*

Fertile spikes ovoid or oblong, obtuse and very thick, rigidly erect on short stalks; *perigynia* longer than the lanceolate pointed scales, which are nearly concealed by the crowded bases of the fruit.

Low meadows. *Culm* 2 feet high, triangular, rough, leafy. *Spike* 1 to 2 inches long, ½ to ¾ inch in diameter, densely flowered.

ORDER 133. GRAMINEÆ.—*Grass Family.*

Grasses, with usually hollow stems (culms) *closed at the joints, alternate 2-ranked leaves, their sheaths split or open on the side opposite the blade; the hypogynous flowers imbricated with 2-ranked glumes or bracts.* STAMENS 1 to 6, commonly 3: ANTHERS versatile, 2-celled. STYLES mostly 2 or 2-parted: STIGMAS feathery or hairy. OVARY 1-celled, forming a seed-like grain (caryopsis) in fruit. FLOWERS green, in small spikelets, arranged in a spiked raceme or panicled manner.

1. LEERSIA, Solander. WHITE GRASS.

Named in honor of *I. D. Leers*, a German botanist.

SPIKELETS 1-flowered, perfect, flat. GLUMES none. PALEÆ (outer perianth) compressed-carinate, awnless, bristly ciliate. STAMENS 1 to 6. STIGMAS feathery, the hairs branching.—*Perennial marsh-grasses with flat leaves, which with the sheaths are rough upwards.*

1. L. ORYSOIDES, Swartz. *Cut-grass. False Rice.*

Panicle diffusely branched, often sheathed at the base; *flowers* elliptical, with 3 stamens; *paleæ* strongly bristly ciliate.

Wet places, common. Aug., Sept. *Culm* retrorsely scabrous, 3 to 5 feet high. *Leaves* lanceolate, acuminate, very rough with hooked prickles. *Panicle* with many widely spreading and flexuous branches.

2. L. VIRGINICA, Willd. *White Grass.*

Panicle simple, the lower branches spreading, the flowers closely appressed and somewhat imbricated on the slender branches; *flowers* oblong, with 2 stamens; *paleæ* sparingly ciliate, greenish-white.

Wet woods. Aug. *Culm* 2 to 4 feet high, slender, branched, erect or decumbent. *Leaves* linear-lanceolate, rough. *Panicle* terminal, at length much exserted.

2. ZIZANIA, Gronov. WILD RICE.

Gr. *Zizanion*, the ancient name of some wild grass.

FLOWERS monœcious, the staminate and pistillate in 1-flowered spikelets in the same panicle. GLUMES none, or only rudimentary. PALEÆ 2, herbaceous, concave, awnless in the sterile. STAMENS 6. STIGMAS pencil-form.—*Large and often reed-like water-grasses, with the spikelets jointed with the clavate pedicels, very deciduous.*

1. Z. AQUATICA, L. *Indian Rice. Water Oats.*

Panicle pyramidal; the lower branches spreading and staminate; the upper erect and pistillate; *pedicels* strongly club-shaped; *lower paleæ* long-awned, rough; *styles* distinct.

Swampy borders of streams and in shallow water. Aug. Ann. *Culm* 3 to 9 feet high, stout terete, smooth. *Leaves* 2 to 3 feet long, linear-lanceolate. *Panicle* terminal, a foot or more long. *Grain* linear, slender, ½ inch long; gathered for food by the North-western Indians.

2. Z. MILIACEA, Michx. *Millet-like Water-Rice.*

Panicle diffuse, pyramidal; *staminate* and *pistillate flowers* intermixed; *awns* short; *styles* united; *grain* ovate.

Swamps, &c. Aug. Per. *Culm* erect, 6 to 10 feet high. *Leaves* involute, very long, narrow, glaucous. *Panicle* terminal, large.

3. ALOPECURUS, Linn. FOX-TAIL GRASS.

Gr. *alopex*, a fox, and *oura*, tail; in allusion to the form of the spike.

SPIKELETS 1-flowered. GLUMES 2, boat-shaped, and keeled, nearly equal, united at the base, equalling or exceeding the lower paleæ, which is awned on the back below the middle; upper paleæ none. STAMENS 3. STYLES mostly united: STIGMAS long and feathered.—*Panicle spiked, cylindric, terminal.*

A. ARISTULATUS, Michx. *Wild Water-Foxtail.*

Glaucous; *paleæ* rather longer than the obtuse glumes, which are wedge-shaped at the base, and hairy on the back and margin; *awns* twice as long as the flower; *anthers* oblong.

Wet meadows, rare. June, Aug. Per. *Culm* 12 to 18 inches high, ascending, knee-jointed at the base, smooth, terete. *Leaves* linear-lanceolate, very acute. *Spike* nearly 2 inches long, pale.

4. PHLEUM, Linn. TIMOTHY.

An ancient Greek name.

GLUMES 2, much longer than the paleæ, distinct, equal, boat-shaped, beaked or mucronate. PALEÆ 2, included in the glumes, awnless, truncate. STYLES distinct.—*Spike very dense, cylindric.*

P. PRATENSE, L. *Timothy. Herd's-Grass.*

Spike cylindrical, elongated; *glumes* ciliate on the back, truncate, tipped with a bristle less than half their length.

Meadows, &c., naturalized, and much cultivated. *Culm* 2 to 3 feet high, simple, smooth. *Leaves* flat, smooth and glaucous. *Spike* green. *Anthers* purplish. Esteemed very valuable for hay.

5. VILFA, Adans. RUSH-GRASS.

SPIKELETS 1-flowered, in a contracted or spiked panicle. GLUMES 1-nerved, carinate; the lower one smaller. PALEÆ 2, much alike; the lower one 1-nerved, rather acute, longer than the glumes; the upper 2-keeled. STAMENS mostly 2. STIGMAS simply feathery. GRAIN oblong or cylindrical, deciduous.—*Culms wiry or rigid: leaves involute, their sheaths often enclosing the lateral panicle. Flower nearly sessile in the glumes.*

1. V. VAGINÆFLORA, Torr. *Hidden-flowered Rush-Grass.*

Culms slender, ascending; *leaves* involute-awl-shaped; *panicles* simple and spiked, the lateral and often the terminal concealed in the sheaths; *glumes* equal, about as large as the paleæ.

Sandy soils. Sept., Oct. Ann. *Culms* about a foot high, tufted. *Leaves* with a slender point. *Panicle* oblong compressed, few-flowered. *Anthers* purple.

2. V. ASPERA, Beauv. *Rough-leaved Rush-Grass.*

Lowest leaves very long, rigid, rough on the edges, tapering to a long involute and filiform point; the upper ones short, involute; *sheaths* partly inclosing the contracted panicle; *paleæ* much longer than the unequal glumes.

Sandy fields and dry hills. Sept. *Culm* 2 to 4 feet high, simple, terete. *Leaves* 1 to 2 feet long. *Panicle* lateral and terminal. *Paleæ* rough above, smooth or hairy below, of greatly variable proportions.

6. SPOROBOLUS, R. Brown. DROP-SEED GRASS.

Gr. *spora*, seed, and *ballo*, to cast forth.

SPIKELETS 1-(rarely 2)-flowered, in a contracted or open panicle. FLOWERS nearly as in Vilfa; the paleæ longer than the unequal glumes. STAMENS 2 or 3. GRAIN a globular utricle, containing a loose seed, deciduous.

S. JUNCEUS, Kunth. *Rush-like Drop-seed Grass.*

Leaves involute, narrow, rigid, the lowest elongated; *culm* naked above, bearing a narrow loose panicle; *glumes* ovate, rather obtuse, the lower one half as long as the upper one.

Dry soil. Aug. *Culm* 1 to 2 feet high. *Spikelets* 1 to 2 lines long, shining.

7. AGROSTIS, Linn. BENT-GRASS.

Gr. *agros*, a field; the place of growth.

SPIKELETS 1-flowered, in an open panicle. GLUMES somewhat unequal, usually longer than the paleæ, pointless. PALEÆ very thin, pointless, naked; the lower 3 to 5-nerved, mostly awned on the back; the upper often minute or wanting. STAMENS mostly 3. GRAIN free.—*Culms usually tufted, slender, bearing a diffuse panicle.*

SEC. I. TRICHODIUM, Michx.—*Upper paleæ* none, or obsolete.

1. A. SCABRUM, Muhl. *Rough Thin-grass.*

Culm geniculate at base, assurgent; *leaves* flat, linear-lanceolate, scabrous on the margin; *panicle* at length diffusely spreading, pale green, the branches short; *glumes* unequal, longer than the awnless paleæ. (A. perennans, *Gray*.)

Damp shaded places. July, Aug. Per. *Culms* 1 to 2 feet high. *Leaves* 4 to 6 inches long, 1 to 2 lines wide.

2. A. LAXIFLORUM, Michx. *Hair-grass.*

Culms very slender, erect; *leaves* short and narrow, lance-linear, the lower soon involute; *panicle* very loose and divergent, purplish; *glumes* unequal acute, longer than the awnless or short-awned paleæ.

Dry fields, common. May. June. Per. *Culm* 18 inches high. *Lower leaves* 3 to 6 inches long, becoming filiform. *Spikelets* clustered at the extremeties of the branchlets. A somewhat variable species.

SEC. II. AGROSTIS proper.—*Upper paleæ* manifest.

3. A. VULGARIS, With. *Red-top. Herd's-grass.*

Rootstocks creeping; *panicle* oblong, with spreading short branches; *ligule* very short, truncate; *lower paleæ* nearly equalling the glumes, chiefly awnless, 3-nerved. (A. hispida, Willd.)

Low meadows, introduced. *Culm* 1 to 2 feet high, mostly upright. *Leaves* linear *Panicle* purple, 4 to 6 inches long. A valuable grass.

4. A. ALBA, L. *White Bent-Grass. Fiarin-Grass.*

Panicle narrow, contracted after flowering, the branches rough; *ligule* oblong or linear; *lower paleæ* rather shorter than the glumes 5-nerved, awnless, or rarely short-awned on the back.

Moist meadows and fields, introduced; native northward. July. *Culm* 1 to 2 feet high, ascending, rooting at the lower joints. *Panicle* greenish-white or barely tinged with purple. A valuable grass.

8. CINNA, Linn. WOOD REED-GRASS.

SPIKELETS 1-flowered, flattened, crowded in an open panicle. GLUMES lanceolate, acute, strongly keeled, nearly equal. PALEÆ 2, nearly equal, compressed, shortly stipitate, naked at the base, the lower one longer than the upper, short-awned near the summit. STAMEN 1, opposite the upper paleæ. GRAIN linear-oblong, free.—*Perennial, rather sweet-scented grasses, with simple upright culms, bearing a large compound terminal panicle, and linear-lanceolate flat leaves.*

C. ARUNDINACEA, L. *Common Wood Reed-Grass.*

Panicle spreading, mostly contracted in fruit; *lower glume* and the *upper paleæ* about ¼ shorter than the lower paleæ.

Moist grounds. Aug. *Culm* simple, smooth, 2 to 5 feet high. *Leaves* a foot or more in length, linear-lanceolate, rough on the margin. *Panicle* 8 to 12 inches long. *Flowers* green or purplish.

9. MUHLENBERGIA, Schreber. DROP-SEED GRASS.

Dedicated to the *Rev. Dr. Muhlenburg,* a distinguished American botanist.

SPIKELETS 1-flowered, in contracted or rarely open panicles. GLUMES mostly acute, persistent; the lower rather smaller or minute. FLOWER very short-stalked or sessile in the glumes. PALEÆ usually bearded at the base, deciduous with the inclosed grain, often equal; the lower 3-nerved, mucronate or awned at the apex. STAMENS 3.—*Chiefly perennials, with branched and often diffuse rigid culms and short narrow leaves.*

1. M. SOBOLIFERA, Gray. *Shooting Muhlenbergia.*

Culms ascending, sparingly branched; *panicle* contracted, filiform, simple, with appressed alternate branches; *glumes* barely pointed, almost equal, ⅓ shorter than the equal paleæ; *lower paleæ* mucronate at the tip.

Open rocky woods. Aug. *Culm* 2 feet high, producing young shoots from the roots. *Leaves* pale green, somewhat scabrous. *Panicle* with the flowers rather crowded.

2. M. MEXICANA, Trin. *Mexican Muhlenbergia.*

Culms ascending, much branched; *panicles* lateral and terminal, often included at the base, contracted, dense-flowered; *glumes* acuminate awnless, unequal; *paleæ* about as long as the glumes, equal, awnless.

Moist grounds. Aug. *Root* creeping. *Culms* 2 to 3 feet high. *Leaves* broad-linear, flat. *Panicles* numerous, terminating the branches, pale green or purplish.

3. M. SYLVATICA, Torr. & Gr. *Wood Muhlenbergia.*

Culms ascending, much branched and diffusely spreading; *panicle* slender, contracted, densely-many-flowered; *glumes* almost equal, bristle-pointed, nearly as long as the lower long-awned paleæ.

Low or rocky woods, common. Sept. *Root* creeping. *Culm* 2 to 4 feet high.

4. M. WILLDENOWII, Trin.

Culms upright, slender, simple or sparingly branched; *panicle* contracted, slender, loosely flowered; *glumes* slightly unequal, short-pointed, half the length of the lower long-awned paleæ. (Agrostis tenuiflora, *Willd.*)

Rocky woods. Aug. *Root* creeping. *Culm* 3 feet high, with swelled and pubescent joints. *Leaves* few, spreading, strongly nerved.

5. M. DIFFUSA, Schreber. *Drop-seed. Nimble Will.*

Culms diffusely much branched; *panicles* contracted, slender, rather loosely many-flowered, terminal and lateral; *glumes* very minute, the lower obsolete, the upper truncate; *awn* about twice as long as the paleæ.

Dry hills and woods. Aug., Sept. *Culm* 8 to 18 inches high, compressed. *Leaves* rough. *Bristle* purplish.

10. BRACHYELYTRUM, Beauv. SHORT-HUSK GRASS.

Gr. *brachus*, short, and *elytron*, husk; from the very short glumes.

SPIKELETS 1-flowered, with a filiform pedicel of an abortive second flower, few in a simple appressed raceme. LOWER GLUMES obsolete. PALEÆ involute, inclosing the linear-oblong grain, somewhat equal, the lower 5-nerved, the upper 2-pointed. STAMENS 2; the linear anthers and stigmas very long.—*A perennial grass, with simple culms, rather downy sheaths, broad and flat lanceolate pointed leaves, and large spikelets.*

B. ARISTATUM, Beauv.

Culm erect, from creeping rootstocks; *panicle* simple, loose.

Rocky woods, common. June. *Culm* 1 to 3 feet high, slender. *Leaves* 4 to 6 inches long. *Lower paleæ* with a very long awn. *Spikelets* ½ inch long.

11. CALAMAGROSTIS, Adans. REED BENT-GRASS.

Gr. *calamos*, a reed, and *agrostis*, a grass.

SPIKELETS 1-flowered, in an open, contracted, or spiked panicle. GLUMES 2, keeled or boat-shaped, often acute, nearly equal. PALEÆ 2, mostly shorter than the glumes, surrounded with a copious tuft of white bristly hairs; the lower one bearing a slender awn on the back or below the tip, rarely awnless. STAMENS 3. GRAIN free.—*Perennials, with running rootstocks, and mostly tall and simple rigid flowers.*

1. C. CANADENSIS, Beauv. *Canadian Reed-Grass.*

Panicle oblong, loose; *lower paleæ* nearly as long as the lanceolate acute glumes, bearing an exceedingly delicate awn below the middle; *rudimentary pedicel* minute. (Arundo Canadensis, *Michx.*)

Wet grounds. July. Rather glaucous. *Culm* 3 to 5 feet high. *Leaves* a foot long, flat, narrow. *Panicle* erect, much divided, at length spreading, often purplish.

2. C. CONFINIS, Nutt. *Close-flowered Reed-Grass.*

Panicle elongated, narrow, the branches appressed after flowering, pale; *lower paleæ* nearly equalling the oblong lanceolate acute glumes, with a rather stout and slightly exserted awn between the middle and the base; *pappus* nearly as long as the flower.

Swamps. July. *Culm* erect, simple, about 3 feet high. *Leaves* about ¼ inch wide, smooth. *Panicle* 5 to 8 inches long.

3. C. COARCTATA, Torr. *Glaucous Reed-Grass.*

Panicle contracted, dense; *lower paleæ* shorter than the acuminate tips of the lanceolate glumes, awned; *pappus* ⅔ as long as the flower.

Wet meadows. Aug. *Culm* 3 to 5 feet high, simple, somewhat glaucous. *Leaves* linear-lanceolate, scabrous and somewhat hairy. *Panicle* 5 to 6 inches long.

12. STIPA, Linn. FEATHER-GRASS.

Gr. *stypa*, tow; in allusion to the flaxen appearance of the feathery awns of some of the species.

SPIKELETS 1-flowered; the flower stipitate. LOWER PA-

LEÆ coriaceous, cylindric-involute, closely embracing the smaller upper one and the cylindrical grain, bearing a long and twisted simple awn, jointed with its apex. STAMENS mostly 3. STIGMAS plumose.—*Perennials, with narrow involute leaves and a loose panicle.*

S. AVENACEA, L. *Black Oat-Grass.*

Culm slender, leafy at the base; *leaves* nearly bristle-form; *panicle* spreading somewhat one-sided; *paleæ* blackish, nearly as long as the pointed glumes; *awn* very long, naked.

Dry or sandy woods. July. *Culm* 1 to 2 feet high. *Leaves* mostly radical, 6 to 3 inches long. *Panicle* nodding. *Awn* 2 to 3 inches long.

13. ARISTIDA, Linn. TRIPLE-AWNED GRASS.

An ancient Latin name, from *arista*, a beard or awn.

FLOWERS stipitate. GLUMES unequal, often bristle-pointed. LOWER PALEÆ tipped with a triple awn; the upper much smaller. SCALES 2, entire, smooth.—*Annuals or perennials, with branching culms, narrow, often involute leaves, and racemed panicles.*

1. A. DICHOTOMA, Michx. *Poverty Grass.*

Culms in tufts, much fork-branched; *spikelets* in short contracted racemes; *flower* rather shorter than the glumes; *lateral awns* very short, the middle not longer than the paleæ, bent down.

Sterile soils. Aug. Ann. *Culm* 5 to 15 inches high. *Leaves* flat, very slender, smoothish. *Racemes* on club-shaped peduncles.

2. A. PURPURASCENS, Poir. *Purple Three-awned Grass.*

Culms mostly simple, filiform, erect; *leaves* very narrow, flat; *panicle* spiked, densely flowered; *awns* nearly equal, 3 or 4 times the length of the paleæ, the middle one rather longest.

Sandy fields and woods. Sept. Per. *Culm* 2 to 3 feet high, clothed with long smooth leaves below. *Panicle* 1 foot long, purple.

14. SPARTINA, Schreber. CORD OR MARSH GRASS.

Gr. *spartina*, a cord; on account of its long and tough leaves.

SPIKELETS imbricate, 1-flowered, much compressed. GLUMES and PALEÆ unequal, awnless. STAMENS 3. STYLES long, mostly united below.—*Perennials, with simple and rigid reed-like culms, long and tough leaves, very smooth sheaths, and racemed spikes.*

1. S. CYNOSUROIDES, Willd. *Fresh-water Cord-Grass.*

Leaves very long, filiform at the end, keeled flat, at length convolute; *spikes* 5 to 40, scattered, spreading; *glumes* awn-pointed; *style* 2-cleft at the summit.

Banks of streams and marshes. Aug. *Culm* 3 to 8 feet high, smooth, terete. *Leaves* 2 to 4 feet long, narrow. *Spikes* linear, 2 or 3 inches long, straw-color.

2. S. JUNCEA, Willd. *Rush-like Cord-Grass.*

Culms low and slender; *leaves* narrow and rush-like, strongly involute; *spikes* 1 to 5, short-peduncled; *glumes* acute, rough-serrulate on the back; *palea* rather obtuse; *styles* distinct nearly to the base.

Salt marshes and river banks. July, Aug. *Root* creeping, forming thick tufts. *Culm* 1 to 2 feet high, rigid, smooth. *Leaves* 6 to 10 inches long, smooth. *Spikes* usually 3.

15. ATHEROPOGON, Muhl.

Gr. *ather*, a bristle, and *pogon*, a beard; the beards being bristle-like.

SPIKELETS one-sided, nearly sessile, alternate, 2 or 3-flowered, the terminal flower abortive. GLUMES 2, membranaceous, unequal; the lower shorter. LOWER PALEÆ 3-nerved, 3-toothed at the apex, the upper 3-nerved and 2-toothed. ABORTIVE FLOWERS pedicellate, neutral. STAMENS 3.—*Spikes short, arranged in a raceme.*

A. APLUDOIDES, Muhl. *Bristle-beard Grass.*

Culms erect, in tufts; *sheaths* commonly hairy; *leaves* narrow, acuminate; *spikes* linear-oblong, almost sessile, horizontal, numerous or rather remote, forming a strict raceme; *rachis* tipped with a slender naked point.

Dry rocky banks, rare. Aug. Per. *Culm* 1 to 3 feet high. *Leaves* lanceolate, attenuate at the end. *Spikes* 20 to 40 on short flat peduncles. *Anthers* bright red.

16. CYNODON, Richard. BERMUDA GRASS.

Gr. *kuon*, a dog, and *odous*, a tooth.

SPIKELETS 1-flowered, with a naked rudiment of a second flower, imbricate-spiked on one side of a flattish rachis. GLUMES keeled, pointless, somewhat unequal. PALEÆ pointless and awnless, the lower larger, boat-shaped. STAMENS 3.—*Low diffusely-branched and creeping perennials, with short flattish leaves, and usually digitate spikes at the naked summit of the flowering culms.*

C. DACTYLON, Pers. *Dog's-tooth Grass.*

Spikes digitate, 3 to 5; *paleæ* smooth, longer than the blunt rudiment.

Sandy waste places; introduced. July, Aug. *Culm* creeping, a foot or more long, prostrate. *Stigmas* dark purple.

17. ELEUSINE, Gært. CRAB-GRASS. YARD-GRASS.

Gr. *Eleusin*, the town where *Ceres*, the goddess of harvests, was worshipped.

SPIKELETS sessile, 2 to 6-flowered, with a terminal naked rudiment. GLUMES membranaceous, pointless, shorter than the flowers. PALEÆ membranaceous, awnless and pointless, the lower ovate, keeled, larger than the upper. STAMENS 3.

PERICARP free from the oval seed.—*Low annuals, with flat leaves, and digitate or clustered 1-sided spikes.*

E. INDICA, Gært. *Dog's-tail Grass. Wire-grass.*

Culms branched at the base, ascending, flattened; *spikes* 2 to 5; *spikelets* about 5-flowered.

Yards and cultivated grounds; introduced. July—Nov. *Culm* 9 to 18 inches long. *Leaves* distichous, linear, somewhat pubescent. *Spikes* usually 2 to 4, 2 inches long, greenish.

18. TRICUSPIS, Beauv.

Lat. *tricuspis*, three-pointed; alluding to the lower paleæ.

SPIKELETS nearly terete, 3 to 12-flowered, the terminal flower abortive. GLUMES shorter than the flowers. LOWER PALEÆ bifid at the apex, and tricuspidate by the projecting keel and marginal nerves, the base villous. STAMENS 3. STIGMAS dark purple, plumose.—*Leaves acuminate; sheaths bearded at the throat. Panicle compound, spreading; the spikelets purplish, often racemed.*

T. SESLERIOIDES, Torr. *Tall Red-top.*

Panicle loose, spreading; *branches* flexuous, smooth; *spikelets* ovate-lanceolate, 5 to 6 flowered, nearly terete, shining.

Sandy fields. Aug. Per. *Culm* 3 to 5 feet high, erect, smooth. *Leaves* long, flat, nerved. *Panicle* very large, at length spreading and pendulous, usually purple.

19. DACTYLIS, Linn. ORCHARD GRASS.

Gr. *daktylos*, a finger; in allusion to the form of the spike.

SPIKELETS 2 to 7-flowered, crowded in one sided clusters, forming a branching dense panicle. GLUMES unequal; the larger keeled, mucronate; the lower 5-nerved, with a fringed keel; upper bifid. STAMENS 3. STIGMAS plumose.—*Perennials, with keeled leaves, and contracted glomerate panicles.*

D. GLOMERATA, L. *Rough Orchard Grass.*

Rough and rather glaucous; *leaves* broadly linear; *branches* of the panicle naked at the base; *spikelets* 3 or 4-flowered.

Fields and meadows; introduced from Europe. June. *Culm* 2 to 3 feet high, erect. *Panicle* glaucous. Good for hay.

20. KŒLERIA.

In honor of *M. Kœler*, a German botanist.

SPIKELETS compressed, 2 to 7-flowered. GLUMES 2, shorter than the flowers; the lower much narrower, keeled. PALEA membranaceous, unequal; the lower acute or obtuse, unawned or with a short awn below the tip; the upper 2-

keeled. STAMENS 3. STYLES very short.—*Perennials, with simple and tufted culms, often downy sheaths, and contracted or spike-like panicles.*

SEC. I. KŒLERIA proper.—*Spikelets* 3 to 7-flowered, crowded in a dense and narrow spike-like panicle.

1. K. CRISTATA, Pers. *Crested Kœleria.*

Panicle narrowly spiked, interrupted at the base; *spikelets* 2 to 4-flowered; *lower palea* acute, often mucronate-pointed.

Dry grounds or hills. June. *Culm* 20 to 30 inches high, smooth, leafy to one-half its height. *Leaves* flat, erect, pubescent, 2 to 3 inches long. Sheaths smooth or downy.

SEC. II. REBOULEA, Kunth.—*Spikelets* usually 2-flowered, and with an abortive rudiment or pedicel, in a contracted or slender panicle.

2. K. PENNSYLVANICA, DC. *Pennsylvanian Kœleria.*

Panicle long and slender, rather loose, the racemose branches somewhat elongated; *upper glume* obovate, barely obtuse; *lower palea* rough.

Moist woods and meadows. May, June. *Culm* about 2 feet high, simple. *Leaves* short, flat. *Panicle* 4 to 8 inches long, very slender with yellowish-green spikelets Varies with a larger and fuller panicle, with the aspect of Cinna.

21. MELICA, Linn. MELIC-GRASS.

An old name from *meli*, honey.

SPIKELETS 2 to 5-flowered, the 1 to 3 upper flowers imperfect and dissimilar, convolute around each other. GLUMES usually large, 2-valved, unequal, the upper 7 to 9-nerved PALEÆ membranaceous, unarmed. STAMENS 3. STIGMAS branched plumose.—*Leaves flat and soft. Panicle simple or sparingly branched.*

M. SPECIOSA, Muhl. *Showy Melic-Grass.*

Smooth; *panicle* loose, erect, with a few spikelets on each branch, each spikelet containing 2 perfect flowers and a stalked rudiment composed of 3 abortive ones; glumes and palea very obtuse.

Rich soil. June. Per. *Culm* 3 to 4 feet high. *Spikelets* ½ inch long.

22. BRIZA, Linn. QUAKING GRASS.

Gr. *brizo*, to nod or hang down; alluding to the pendulous spikelets.

SPIKELETS many-flowered, ovate or heart-shaped. GLUMES roundish, unequal, purple. PALEÆ inflated; lower one cordate at base, embracing the upper, which is nearly round and much shorter. STAMENS 3. STIGMAS branched plumose. GRAIN flattened.—*Leaves flat. Panicle loose, with the large and showy spikelets often drooping on delicate spikelets.*

B. MEDIA, L. *Common Quaking Grass.*

Panicle erect, the branches spreading; *spikelets* 5 to 9-flowered, heart-shaped when old.

Meadows; naturalized. June. Per. *Culm* 3 to 4 feet high.

23. GLYCERIA, R. Brown. MANNA-GRASS.

Gr. *glukeros*, sweet; alluding to the sweet-tasted grain.

SPIKELETS mostly terete, long, linear, many-flowered; RACHIS jointed. GLUMES 2, membranaceous, nearly equal, pointless. PALEÆ somewhat chartaceous, nearly equal, naked, the lower rounded on the back, strongly 7-nerved, the upper 2-keeled. STAMENS 3 or 2. STIGMAS decompound. GRAIN oblong.—*Perennial smooth marsh-grasses, with simple culms from running root-stocks, flat leaves and nearly entire sheaths; the panicle loose and open.*

1. G. FLUITANS, R. Brown. *Common Manna grass.*

Panicle 1-sided slightly branched; *spikelets* 7 to 13-flowered, appressed; *lower paleæ* oblong, obtuse.

Shallow water, common. June, July. *Culm* thickish. 2 to 15 feet high, from a creeping root. *Leaves* short and rather broad, very smooth. *Panicle* 12 to 15 inches long, slender, partly concealed in the upper sheath.

2. G. OBTUSA, Trin. *Obtuse-flowered Manna-grass.*

Panicle dense, narrowly oblong; *spikelets* ovate, 6 to 7-flowered; *glumes* scarious; *lower paleæ* ovate, obtuse, the upper as long when old.

Swamps, rare. Aug., Sept. *Culm* stout, 1 to 2 feet high, very leafy. *Leaves* linear, long, smooth. *Panicle* 3 to 4 inches long, many-flowered.

3. G. ELONGATA, Trin. *Long-panicled Manna-grass.*

Panicle narrowly racemose, elongated, somewhat 1-sided, recurving; the branches appressed, bearing the 3 to 4-flowered spikelets nearly to the base; *lower paleæ* oblong-ovate, obtuse, rather longer than the upper.

Wet woods, common. July. *Culm* 3 to 4 feet high, simple. *Leaves* 1 foot or more long, rough. *Panicle* 1 foot long. *Spikelets* pale, with short pedicelled flowers.

4. G. NERVATA, Trin. *Nerved Manna-grass.*

Panicle diffuse, loose, the branches capillary, at length drooping; *spikelets* very numerous, ovate oblong, 3 to 7-flowered; *paleæ* oval, obtuse, nearly equal in length.

Moist meadows, common. June. *Culm* erect, 1 to 3 feet high. *Leaves* rather long, narrow-linear, flat, smooth. *Panicle* large, broad and open, often purplish.

24. POA, Linn. MEADOW-GRASS. SPEAR-GRASS.

An ancient Greek name for grass.

SPIKELETS ovate or oblong, compressed, few-flowered, in an open panicle. GLUMES 2, mostly shorter than the flowers. PALEÆ nearly equal, membranaceous, awnless, often with a villous web at the base; the lower one keeled or concave; upper one 2-keeled. STAMENS 2 or 3. STIGMAS plumose. GRAIN oblong.—*Grasses, with tufted culms, smooth usually flat and soft leaves, and the spikelets in diffuse or contracted panicles.*

1. P. ANNUA, L. *Low Spear-grass.*

Culms spreading or decumbent, flattish; *panicle* short and broad, often 1-sided, at length spreading; *spikelets* crowded, very short-pedicelled, 3 to 7-flowered.

Cultivated and waste grounds, very common. April—Oct. *Culms* 3 to 8 inches high, very smooth. *Leaves* lance-linear, short, bright brown.

2. P. PUNGENS, Nutt. *Vernal Spear-grass.*

Culm compressed; *panicle* somewhat simple, spreading; *spikelets* lanceolate, 3 or 4-flowered, crowded at the extremeties of the branches; *flowers* rather obtuse.

Rocky places. April, May. Per. *Culm* stoloniferous from the base, 1 to 2 feet high. *Leaves* very short, cuspidate, the radical ones long, linear, those of the culm usually 2, lanceolate, very short.

3. P. SEROTINA, Ehrh. *Red-top.*

Culm erect, smooth; *panicle* diffuse, elongated, at length somewhat nodding at the top, the branches mostly in pairs; *spikelets* numerous ovate-lanceolate, 2 to 4-flowered; *glumes* lanceolate, sharp pointed.

Banks of streams and wet meadows, common. June, July. Per. *Culm* 2 to 3 feet high. *Leaves* narrow-linear, flat, smooth. *Panicle* 6 to 10 inches long, the branches mostly whorled. *Spikelets* green, or often tinged with dull purple.

4. P. PRATENSIS, L. *Spear-grass. Meadow grass.*

Culms from a creeping base, and with the sheaths smooth; *panicle* pyramidal, somewhat crowded, the branches commonly in fives, spreading; *spikelets* 3 to 5-flowered, oblong ovate; *flowers* acute.

Fields and meadows, very common in cultivation. May—July. Per. *Root* creeping. *Culm* 2 to 3 feet high. *Leaves* keeled, linear, abruptly acute, deep green, the lower very long. Highly prized as a pasture grass.

5. P. COMPRESSA, L. *Blue-grass. Wire-grass.*

Culm much flattened, obliquely ascending; *panicle* contracted, somewhat 1-sided; *spikelets* 4 to 9-flowered, flattened; *flowers* linear-elliptical, rather obtuse, hairy below on the keel.

Fields and pastures, common; introduced. June, July. Per. *Root* creeping extensively. *Culm* 12 to 18 inches high. *Leaves* short, bluish, smooth.

6. P. CONFERTA, Ell. *Clustered Meadow Grass.*

Culm erect, geniculate; *panicle* terminal and axillary, erect; *spikelets* about 5-flowered, compressed; *flowers* clustered, smooth.

Meadows, rare. *Schweinitz.* Per. *Culm* 2 to 3 feet high. *Leaves* smooth, serrulate on the margin. *Panicle* 4 to 8 inches long.

25. ERAGROSTIS, Beauv.

An early name, probably from *era*, the earth, and *Agrostis*.

SPIKELETS 2 to 70-flowered, nearly as in Poa, except that the lower palea is but 3-nerved, not webby at the base, and the upper is persistent on the rachis for some time after the rest of the flower is fallen.—*Culms often branching: leaves linear, frequently involute, and the ligule bearded. Panicle various.*

1. E. PILOSA; Beauv. *Pilose Eragrostis.*

Panicle loose, ample, with capillary branches, all but the lower scattered and naked in the axils, compound; *spikelets* 5 to 12 flowered, nearly linear, flattish; *flowers* ovate-acutish.

Sandy soil. Aug. Ann. *Culms* 5 to 12 inches high, tufted. *Leaves* flat or involute, bearded with long hairs at the throat. *Spikelets* ¼ to ½ inch long, purplish.

2. E. CAPILLARIS, Nees. *Capillary Eragrostis.*

Panicle expanding, very compound, delicate; the axils naked; *spikelets* oblong 2 to 4-flowered, on long capillary pedicels. (Poa capillaris, L.)

Dry sandy places, common. August. Ann. *Culms* 12 to 18 inches high, tufted. *Leaves* linear, flat, the sheaths fringed with long hairs. *Panicle* 8 to 18 inches long, much branched.

3. E. SPECTABILIS, Gray. *Showy Eragrostis.*

Panicle divergently spreading, the rigid branches reflexed with age, and a bearded tuft in the principal axils; *spikelets* oblong or linear 7 to 10 or 15-flowered; *flowers* ovate, minutely ciliate. (P. spectabilis, Pursh.)

Sandy fields. Aug, Sept. Ann. *Culm* and long *leaves* rigid, mostly smooth; *lower sheaths* often downy. *Panicle* 1 to 2 feet long, with purplish spikelets.

26. FESTUCA, Linn. FESCUE-GRASS.

An ancient Latin name.

SPIKELETS oblong, 3 to many-flowered; the flowers not webby at the base. GLUMES unequal, mostly keeled. PALEA chartaceous or almost coriaceous, roundish on the back, acute, mucronate or awned at the summit, the upper mostly adhering at maturity to the inclosed grain. STAMENS mostly 3. STIGMAS simply plumose.—*Flowers and leaves rather dry and harsh. Spikelets panicled or racemose.*

1. F. ELATIOR, L. *Tall Fescue-Grass.*

Panicle branched, loose, rather spreading; *spikelets* crowded, 4 to 6 flowered; *lower palæ* nearly pointless; *flowers* cylindric.

Moist meadows and pastures. June. Per. *Culm* 3 to 5 feet high. *Leaves* broad-linear, 9 to 15 inches long. *Panicle* 6 to 10 inches long, mostly nodding. *Spikelets* ½ inch long. Introduced.

2. F. PRATENSIS, Hudson. *Meadow Fescue-Grass.*

Panicle simple, or sparingly branched; *spikelets* 5 to 10-flowered; *lower palea* barely acute.

Fields and meadows, common, naturalized. June, July. Per. *Culm* 2 to 3 feet high, without a creeping base. *Leaves* broad-linear, nerved, smooth, rough on the margin. *Panicle* 4 to 8 inches long, somewhat one-sided.

3. F. NUTANS, Willd. *Nodding Fescue-Grass.*

Panicle of several slender and spreading branches, mostly in pairs, drooping when old, naked below, bearing near their extremity a few ovate 3 to 5-flowered spikelets; *flowers* ovate oblong, rather obtuse, close together.

Rocky and open woods. July. Per. *Culm* 2 to 4 feet high, naked above. *Leaves* broadly-linear, acuminate, dark green, often rather hairy. *Panicle* few-flowered.

4. F. RUBRA, L. *Red or Creeping Fescue-Grass.*

Panicle one-sided, erect, spreading; *spikelets* somewhat terete, 5 or 6 flowered; *flowers* longer than their awns.

Dry soils. June. Per. *Root* extensively creeping. *Culm* 12 to 18 inches high, erect. *Leaves* long pubescent on the upper side. *Panicle* contracted. Introduced.

27. BROMUS, Linn. Brome-grass. Cheat.

Bromos, a name given by the Greeks to a kind of oats.

Spikelets oblong, 5 to many-flowered, panicled. Glumes unequal, membranaceous, the lower 1 to 5-nerved, the upper 3 to 9-nerved. Lower paleæ bifid at the apex, and usually awned a little below the tip; upper 2-keeled, at length adhering to the groove of the oblong or linear grain. Stamens 3. Stigmas simply plumose.—*Coarse grasses, with large spikelets, at length drooping on pedicels thickened at the apex.*

1. B. ciliatus, L. *Ciliate Brome-grass.*

Panicle compound, very loose, the elongated branches at length divergent, drooping; *spikelets* 7 to 12-flowered; *lower glume* 1-nerved; *flowers* oblong-lanceolate, tipped with an awn, ½ to ¾ their length; *upper paleæ* bristly-ciliate; the lower silky, with appressed hairs near the margins. (B. Canadensis, *Michx.* B. pubescens, *Muhl.* B. purgans, *L.*)

River banks and moist woodlands. July, Aug. Per. *Culm* 3 to 4 feet high. *Leaves* large, ¼ to ½ inch wide smooth or somewhat hairy; the sheaths often hairy or densely downy near the top. Variable as to its pubescence, &c.

2. B. secalinus, L. *Cheat. Chess.*

Panicle spreading, the drooping peduncles but slightly branched; *spikelets* oblong-ovate, turgid, smooth, of 8 to 10 flowers overlapping each other, mostly longer than the awns; *lower glumes* 5-nerved; upper 7-nerved.

Cultivated grounds, common in grain fields. June. Ann. *Culm* 2 to 3 feet high, with swollen and pubescent joints. *Leaves* broad linear, hairy above. *Panicle* 4 to 6 inches long. Introduced from Europe. This troublesome grass is very common in wheat fields, especially when the grain is injured by frost; which has given rise to the common, but mistaken idea, that wheat is changed into this plant.

3. B. mollis, L. *Soft Brome-grass.*

Panicle erect, close, compound; *spikelets* ovate, flattish, the flowers closely imbricated, downy, as long as the awn.

Fields and pastures, sparingly naturalized. June. Biennial. *Culm* 1 to 2 feet high. *Leaves* very soft, pubescent. *Panicle* 3 to 4 inches long. *Spikelets* nearly erect, 5 to 10-flowered.

4. B. arvensis, L. *Field Brome-grass.*

Panicle erect, spreading; *spikelets* lanceolate, compressed, 7 to 8-flowered; *flower* imbricate, compressed, smoothish, about as long as the straight awn.

Fields and meadows. West Chester. Darlington. June, July. Ann. *Culm* about 2 feet high, smooth, with dark-colored pubescent joints. *Leaves* lance-linear, hairy on both sides. *Panicle* slender, spreading, at length drooping.

28. UNIOLA, Linn. Spike-grass.

An ancient name of some grass.

Spikelets compressed, many-flowered; one or more of the lower flowers sterile, and consisting of a single paleæ.

Glumes keeled. Paleæ of the perfect flowers 2; lower one boat-shaped; upper smaller, doubly keeled. Stamens mostly 1.—*Upright perennials, in tufts from creeping rootstocks, with broad leaves and large spikelets in a panicle.*

U. latifolia, Michx. *Broad-leaved Spike-grass.*

Spikelets on slender pedicels, drooping in an ample loose panicle, oblong-ovate, 10 to 15-flowered; *flowers* nearly appressed, ovate-lanceolate and acuminate, somewhat falcate; *stamen* 1.

Mountains and shaded banks. Aug. *Culm* 3 to 4 feet high, somewhat branching. *Leaves* flat, nearly 1 inch wide, *Panicle* 1 foot long, loose. *Spikelets* 1 inch long and ½ inch wide.

29. PHRAGMITES, Trin. Reed.

Gr. *phragmites*, growing in, or forming *hedges*.

Spikelets 3 to 7-flowered; flowers surrounded by a tuft of hairs, all 3-androus and perfect, except the lowest, which is either neutral or with a single stamen, and naked. Glumes 2, lanceolate, unequal. Paleæ very unequal; the lowest one elongated, acuminate; the upper 2-keeled. Styles long.—*Tall and stout perennials, with numerous broad leaves, and a large terminal panicle.*

P. communis, Trin. *Common Reed Grass.*

Panicle loose, diffuse when old; *spikelets* 3 to 5-flowered. (Arundo Phragmites, *L.*)

Edges of ponds and swamps. Aug., Sept. *Culm* 9 to 12 feet high, very leafy, with numerous joints. *Leaves* 1 to 2 feet long, linear-lanceolate, flat, glaucous. *Panicle* very large, loose. The largest grass in the Northern States; resembling Broom-corn at a distance.

30. TRITICUM, Linn. Wheat.

The classical name.

Spikelets 3 to many-flowered, single at each joint, and placed with the side against the rachis. Glumes transverse, nearly equal and opposite, herbaceous, nerved. Paleæ lanceolate; the lower one concave, acuminate or awned at the summit; the upper one flattened, bristly-ciliate on the nerves, free or adherent to the grooves of the grain. Stamens 3.—*Flowers spiked.*

Sec. i. Agropyrum, Gært. Perennials. *Spikes* 2-ranked; *glumes* acute or pointed.

1. T. repens, L. *Couch-grass. Quitch-grass.*

Rootstocks creeping extensively; *spikelets* 4 to 8-flowered; *glumes* 5 to 7-nerved; *rachis* rough on the angles; *awn* none, or very short.

Fields and meadows, naturalized and troublesome. June—Aug. *Culm* 1 to 2 feet high. *Leaves* flat, roughish or hairy above, lance-linear. *Spike* 3 to 5 inches long.

2. T. CANINUM, L. *Awned Wheat-grass.*

Root fibrous, not creeping; *spikelets* 4 or 5-flowered; *glumes* 3-nerved; *rachis* bristly on the edges; *awn* longer than the smooth flower.

Woods and banks, introduced. July. *Culm* 2 to 3 feet high. *Leaves* flat, roughish on both sides.

SEC. II. TRITICUM proper. Annuals. *Glumes* ovate-oblong and ventricose boat-shaped.

3. T. SATIVUM, L. *Wheat.*

Culm round, smooth, with the internodes somewhat inflated; *stipules* truncate; *spike* parallel, somewhat 4-sided; *spikelets* crowded, broad-ovate, about 4-flowered; *awns* of the upper paleæ generally longer than the flowers. Annual and Biennial. This is the most valuable plant of the order, and is universally cultivated. Many varieties are known to farmers.

32. LOLIUM, Linn. DARNEL.

The ancient Latin name.

SPIKELETS many-flowered, solitary, and placed edgewise on the continuous rachis. INNER GLUME mostly wanting. LOWER PALEÆ lanceolate, mucronate or with a short bristle at the tip; upper one 2-beaked.—*Spike simple: rachis not jointed.*

1. L. PERENNE, L. *Common Darnel. Rye-grass.*

Glume much shorter than the spikelet; *flowers* 6 to 9, awnless, sometimes awn-pointed.

Meadows and fields; naturalized. June. Per. *Culm* 1 to 2 feet high, smooth. *Leaves* lance-linear, smooth, shining. *Spikelets* 12 to 20, alternate, forming a spike about 6 inches long. A good pasture grass.

2. L. TEMULENTUM, L. *Bearded Darnel.*

Glume fully equalling the 5 to 7-flowered spikelet; *awn* longer than the flower.

Old fields. July. Ann. *Culm* about 2 feet high, terete. *Leaves* lance-linear, rough on the margins. *Spikelets* much compressed. The seeds are said to be poisonous. Introduced from Europe.

32. ELYMUS, Linn. LYME-GRASS. WILD RYE.

Gr. *Elymos*, a hull, also an ancient name for some grain.

SPIKELETS 2 to 4 at each joint of the rachis, all fertile, each 2 to 7-flowered; the uppermost flower imperfect. GLUMES nearly side by side in front of the spikelets, rarely wanting. PALEÆ coriaceous, the lower rounded on the back, usually awned at the apex.—*Rye-like grasses, with simple spikes.*

1. E. VIRGINICUS, L. *Wild Rye.*

Spike rigidly upright, dense and thick, on a short peduncle usually included in the sheaths; *spikelets* 2 or 3 together, 2 or 3-flowered, smooth, short-awned; *glumes* lanceolate, strongly nerved.

River banks. Aug. Per. *Culm* 2 to 3 feet high, smooth. *Leaves* broadly linear, flat, rough, deep green. *Spike* 3 to 5 inches long, stiffly erect, thick.

2. E. Canadensis, L. *Canadian Lyme-grass.*

Spike rather loose, curving, on an exserted peduncle; *spikelets* mostly in pairs of 3 to 5 long-awned rough or rough-hairy flowers; *glumes* lance awl-shaped, tipped, with short awns.

River banks, in rich soil. Aug. Per. *Root* creeping. *Culm* 3 to 4 feet high, erect. *Leaves* broad-linear, flat, somewhat rough. *Spike* 6 to 8 inches long, at length nodding. A variety (E. glaucifolius of Muhl.) is pale or glaucous throughout, with spreading awns 1½ inch long.

3. E. Hystrix, L. *Bottle-brush Grass.*

Spike erect, loose; the spreading spikelets 2 or 3 together, early deciduous from the joints, about 3-flowered; *flowers* smoothish, or often rough-hairy, tipped with an awn thrice their length.

Moist woodlands, common. July. Per. *Culm* 2 to 4 feet high, erect, smooth. *Leaves* broad-linear flat, and with the sheaths smoothish. *Spike* 4 to 6 inches long, at length spreading.

4. E. striatus, Willd. *Striated Lime-grass.*

Spike erect; *spikelets* in pairs, 2-flowered, awned, hispid; *glumes* linear, nerved, awned, nearly as long as the spikelets.

Shady woods, June, rare. Per. *Culm* 8 to 12 inches high, erect, striate. *Leaves* lanceolate, acuminate, rough above; *sheaths* smooth. *Leaves* somewhat spreading.

33. HORDEUM, Linn. Barley.

The ancient Latin name.

Spikelets 1-flowered, with an awl-shaped rudiment on the inner side, 3 at each joint of the rachis, the lateral ones usually imperfect. Glumes side by side in front of the spikelets, slender, awn-pointed or subulate. Paleæ 2, the lower with a long awn, the upper 2-keeled, obtuse. Stamens 3.—*Spike dense, simple, the rachis often seperating into joints.*

1. H. vulgare, L. *Common Barley.*

Culm smooth, 2 to 3 feet high; *leaves* lance-linear, keeled, nearly smooth; *sheaths* auricled at the throat; *spike* thick, about 3 inches long; *spikelets* all fertile, 1-flowered, with an awn like rudiment at the apex of the upper paleæ; *glumes* collateral; *flowers* in four rows. Ann. Extensively cultivated. May.

2. H. distichum, L. *Two-rowed Barley.*

Culm 2 to 3 feet high; *leaves* lance-linear, scabrous above; *sheaths* auricled at the throat; *spike* 3 to 4 inches long, linear, compressed; *lateral spikelets* abortive, awnless; *fruit* arranged in two rows. Ann. more common in cultivation than the former species.

34. AIRA, Linn. Hair-grass.

An ancient Greek name for Darnel.

Spikelets 2-flowered, in an open diffuse panicle. Glumes 2, unequal, about as long as the flowers. Paleæ thin and membranaceous, the lower one awned on the back below the middle, 3 to 5-nerved. STAMENS 3.

1. A. FLEXUOSA, L. *Common Hair-grass.*

Panicle loose, spreading, trichotomously branched; *branches* smoothish, flexuous; *flowers* scarcely longer than the glumes; *lower paleæ* slightly 2-toothed.

Dry rocky or sandy places, common. June. Per. *Culm* 1 to 2 feet high, slender, from small tufts of setaceous involute leaves. *Panicle* whitish, the lower branches somewhat whorled.

2. A. CÆSPITOSA, L. *Tufted Hair-grass.*

Panicle pyramidal or oblong; *lower paleæ* eroded-4-toothed at the truncate apex; *awn* straight, short.

Wet places. June, July. Per. *Culms* 2 to 3 feet high, in close tufts. *Leaves* flat, linear, roughish. *Panicle* dull purplish, the branches somewhat whorled.

3. A. PRÆCOX, L. *Early Hair-grass.*

Panicle small, oblong, somewhat spiked; *lower paleæ* with 2 awl-pointed tips; *awn* twisted, inserted below the middle, longer than the flowers.

Sandy fields. June. *Culms* 3 to 4 inches high, tufted. *Leaves* short, smooth, setaceous. *Panicle* few-flowered, greenish.

35. SECALE, Linn. RYE.

SPIKELETS solitary on the teeth of the rachis, 2 or 3-flowered; the 2 lowest flowers fertile, sessile, opposite; the upper one abortive. GLUMES awl-shaped, opposite, shorter than the flowers. LOWER PALEÆ with a very long awn; upper often bifid at the apex. SCALES abortive, hairy.

S. CEREALE, L. *Rye.*

Culm hairy beneath the spike, 4 to 6 feet high; *leaves* lance-linear, rough-edged rough above, glaucous; *spike* about 5 inches long, linear, compressed; *paleæ* smooth; *awns* scabrous ciliate, long. Ann. or Biennial. June. The rye has long been cultivated and may be considered naturalized.

36. TRISETUM, Persoon.

Lat. *tris*, three, and *seta*, a bristle.

SPIKELETS 2 to several-flowered, usually in a contracted panicle. LOWER PALEÆ compressed-keeled, awned below the sharply 2-cleft or 2-pointed apex:—otherwise nearly as in Aira.

T. PALUSTRE, Torr. *Meadow Trisetum.*

Smooth; *panicle* rather long and narrow, loose, the branches capillary; *spikelets* flat; *glumes* rather unequal, shorther than the 2 smooth lanceolate flowers; *lower paleæ* ending in 2 setose teeth.

Wet meadows, rare. May—July. Per. *Culm* slender 2 to 3 feet high. *Leaves* flat, lance-linear, about 3 inches long. *Spikelets* yellowish-white, tinged with green.

37. DANTHONIA, DC. WILD OAT-GRASS.

In honor of *M. Danthoine*, a French botanist.

SPIKELETS 2 to 10-flowered; the upper flower often imperfect. GLUMES nearly equal, mostly longer than the flower. PALEÆ hairy at the base; lower one 2-toothed at the summit, with a twisted awn between the teeth; upper one obtuse, entire.—*Flowers in a spiked panicle.*

D. SPICATA, Beauv. *Wild Oats.*

Panicle simple, raceme-like, rather 1-sided; *spikelets* few, appressed, 7-flowered; *lower paleæ* broadly-ovate, loosely hairy on the back, about ½ the length of the awn.

Dry and sterile or rocky soil. July. *Culms* tufted, 1 to 2 feet high, erect. *Leaves* short somewhat involute-awl-shaped; *sheaths* bearded at the throat.

38. AVENA, Linn. OAT.

The classical Latin name.

SPIKELETS 3 to many-flowered, panicled, commonly large. FLOWERS rather remote, the upper ones often imperfect. GLUMES loose and membranaceous, nearly equal. PALEÆ 2; the lower one bifid at the summit, with a long twisted awn on the back below the tip. STAMENS 3. GRAIN oblong-linear, grooved on one side.—*Panicle compound, loose.*

1. A. SATIVA, L. *Common Oat.*

Culm 2 to 4 feet high; *leaves* linear-lanceolate, veined, rough, with loose striate sheaths; *stipules* torn; *panicle* loose; *spikelets* pedunculate, pendulous, 2-flowered *palea* somewhat cartilaginous, closely embracing the grain. Ann. A highly important grain.

2. A. STERILIS, L. *Animated Oat.*

Stem 3 to 4 feet high, and with the leaves smooth, the latter long, acute, flat; *spikelets* 5-flowered; *outer flowers* and *awns* hairy, *inner flowers* awnless. Ann. From Barbary. Cultivated as a curiosity. The awns are 2 inches long, geniculate and twisted more or less according to the state of the atmosphere.

39. HOLCUS, Linn. SOFT GRASS.

An ancient name, of obscure application.

SPIKELETS 2 or 3-flowered in a contracted panicle, polygamous. GLUMES herbaceous, somewhat boat-shaped, mucronate. Lowest flower neutral, small and abortive, or obsolete; the middle one perfect, 3-androus, awnless; the upper one staminate only, 3-androus, bristle-awned towards the tip.

H. LANATUS, L. *Velvet-grass. White Timothy.*

Soft-downy, pale; *panicle* oblong; *upper glume* mucronate under the apex; *awn* of the staminate flower recurved.

Moist meadows. June. Per. *Root* fibrous. *Culm* 18 inches high. *Leaves* 2 to 5 inches long, flat. *Glumes* pubescent, whitish or tinged with purple. Introduced from Europe.

40. ANTHOXANTHUM, Linn. VERNAL-GRASS.

Gr. *anthos*, flower, and *xanthos*, yellow; from the color of the spikes.

SPIKELETS 3-flowered, the two lower flowers neutral and each consisting of a single awned paleæ; the upper flowers perfect, of 2 paleæ, diandrous, nearly equal, short, awnles.—*Panicle contracted or spike-like.*

A. ODORATUM, L. *Sweet-scented Vernal-grass.*

Panicle spiked, the spikelets spreading; one of the neutral flowers with a bent awn near its base, the other short-awned below the tip.

Meadows and woods, completely naturalized. June—Aug. Per. *Culm* about a foot high, erect. *Leaves* short. *Panicle* 1 to 2 inches long, yellow or brownish when mature. Very fragrant when about half dry.

41. PHALARIS, Linn. CANARY-GRASS. RIBBON-GRASS.

Gr. *phalos*, shining; in allusion to the smooth paleæ.

SPIKELETS 3-flowered; the two lower flowers mere neutral rudiments at the base of the perfect one, which is flattish awnless, of 2 shining paleæ, shorter than the equal boat-shaped glumes. STAMENS 3.—*Leaves broad, flat. Panicle dense and spike-like.*

P. ARUNDINACEA, L. *Reed Canary-grass. Ribbon-grass.*

Panicle more or less branched, clustered, a little spreading when old; *glumes* obtusely keeled; *paleæ* unequal; *abortive flowers* hairy.

Swamps. July. Aug. Per. *Culm* 2 to 5 feet high, erect, a little branching. *Leaves* deep green, sometimes variegated with white, when it is the "Ribbon grass" of the gardens. *Panicle* 2 to 4 inches long.

42. PANICUM, Linn. PANIC-GRASS.

An ancient Latin name.

SPIKELETS 2-flowered, naked. GLUMES 2, unequal, membranaceous, concave. LOWER FLOWER of 1 or 2 paleæ, staminate or neutral, membranaceous. UPPER FLOWER perfect, closed, with 2 paleæ, inclosing the free and grooveless grain. STAMENS 3. STIGMAS plumose, usually purple.—*Spikelets panicled, racemed, or sometimes spiked, not involucrate.*

SEC. I. DIGITARIA, Scop. *Finger-Grass.* *Spikelets* crowded, 2 or 3 together in simple and mostly 1-sided clustered spikes or spike-like racemes.—*Annuals.*

1. P. SANGUINALE, L. *Finger-grass. Crab-grass.*

Spikes 4 to 15, digitate-clustered; *spikelets* oblong, downy-margined; *upper glume* shorter than the flower.

Cultivated grounds, everywhere naturalized. Aug.—Oct. *Culm* 12 to 18 inches high, spreading from the tufted base, then upright. *Leaves* linear-lanceolate, and with the sheaths rather hairy. *Spikes* and often the leaves purplish.

2. P. GLABRUM, Gaudin. *Smooth Finger-grass.*

Spikes digitate, somewhat alternate, spreading; *spikelets* ovoid, rather hairy; *upper glume* nearly equalling the flower.

Sandy fields. Aug., Sept. *Culm* 6 to 12 inches high, procumbent or spreading. *Spikes* mostly 3 (2 to 6), about 2 inches long.

3. P. FILIFORME, L. *Slender Finger-grass.*

Spikes 2 to 8, alternate and approximated, thread-like; *spikelets* all distinctly pedicelled, oblong, acute; *lower glume* none.

Dry sandy soil. Aug. *Culms* extremely slender, 1 to 2 feet high. *Leaves* narrow, 1 to 2 inches long. *Spikes* mostly 3, 1 to 2 inches long; *rachis* rough, flexuous.

SEC. II. PANICUM proper. *Panic-Grass.* *Spikelets* scattered, awnless.—*Mostly perennials.*

4. P. ANCEPS, Michx. *Two-edged Panic-grass.*

Panicle contracted, pyramidal; *spikelets* ovate-lanceolate, pointed, a little curved; *upper glume* 7-nerved; *neutral flowers* ⅓ longer than the perfect, of 2 paleæ.

Wet soil. Aug. *Culms* flat, upright, 2 to 4 feet high. *Leaves* linear-lanceolate, 1 to 2 feet long, ⅓ to ½ inch wide, smoothish.

5. P. AGROSTOIDES, Spreng. *Agrostis-like Panic-grass.*

Panicles terminal and often lateral, pyramidal; *spikelets* racemose, crowded and 1-sided, on the spreading branches, ovate-oblong, acute, purplish; *upper glume* 5-nerved, longer than the neutral flower, with 2 paleæ.

Wet meadows. Aug. *Culm* 2 to 3 feet high, flattened, upright. *Leaves* long and with the sheaths smooth, tufted. *Panicle* 4 to 8 inches long, mostly dark purple.

6. P. PROLIFERUM, Lam. *Proliferous Panic-grass.*

Smooth throughout; *panicles* terminal and lateral, compound, pyramidal; *spikelets* appressed, lance-oval, acute; *lower glume* broad, ⅓ to ¼ the length of the upper; *neutral flower* little longer than the perfect one, of a single paleæ.

Wet meadows and marshes. Aug., Sept. Ann. *Culms* thickened, succulent, branched, ascending from a procumbent base. *Leaves* 8 to 12 inches long; *sheaths* flattened.

7. P. CAPILLARE, L. *Hair-stalked Panic-grass.*

Panicle pyramidal, capillary, compound and very loose, with slender straight branches, reflexed when old; *spikelets* scattered on long pedicels, oblong, pointed; *lower glume* half the length of the single paleæ of the neutral flower.

Sandy soil and cultivated fields, common. Aug., Sept. Ann. *Culm* upright, often branched at base and forming a tuft. *Leaves* flat, broad, and with the flattened sheaths hairy. *Panicle* often purplish.

8. P. LATIFOLIUM, L. *Broad-leaved Panic-grass.*

Panicle terminal, a little exserted, simple, pubescent; *spikelets* oblong-ovoid, downy; *lower glume* ovate, not ½ the length of the many-nerved upper one; *sterile flower* mostly with 3 stamens.

Moist woods and thickets, common. June, July. *Culm* 1 to 2 feet high, smooth, the joints and margins of the smooth sheaths bearded with soft woolly hairs. *Leaves* broadly oblong-lanceolate from a heart-clasping base, often 1 inch wide. *Panicle* 2 inches long, with downy branches.

9. P. CLANDESTINUM, L. *Hidden-flowered Panic-grass.*

Sheaths hispid, enclosing the short lateral panicles; *spikelets* ovoid, pubescent, the lower flower neutral, with 2 paleæ.

Low thickets and river banks. Aug. *Culm* 1 to 3 feet high, very leafy to the top, at length producing appressed branches. *Leaves* oblong-lanceolate, from a heart-clasping base, very acuminate. *Panicles* terminal and lateral, the former wholly concealed in the leaves, exserted, or on a long peduncle. *Anthers* and *stigmas* purple.

10. P. MICROCARPON, Muhl. *Small-pointed Panic grass.*

Panicle soon exserted, very many-flowered, narrowly oblong; *spikelets* long, ovoid, smoothish; *lower glume* orbicular, very small.

Thickets. July. *Culm* 1 to 2 feet high, smooth, the joints and the orifice of the throat of the sheaths bearded with soft woolly hairs. *Leaves* broadly lanceolate, rough-margined, bristly-ciliate. *Panicle* 3 to 7 inches long.

11. P. PAUCIFLORUM, Ell. *Small-flowered Panic-grass.*

Panicle open, nearly simple, bearing few tumid-obovate hairy or smoothish spikelets; *lower glume* ¼ to ½ the length of the upper one.

Wet meadows and copses. June, July. *Culm* 1 to 2 feet high, at length much branched and reclining, roughish. *Leaves* lanceolate, 2 to 5 inches long, ⅓ to ½ inch wide, faintly 9-nerved, hairy or smooth, fringed on the margin.

12. P. DICHOTOMUM, L. *Variable Panic-grass.*

Panicle small, lateral, nearly simple; *spikelets* minute, on long peduncles, obovoid, mostly pubescent; *lower glume* ⅓ the length of the upper; *lower flower* neutral, the upper paleæ minute.

Moist meadows and woods. July—Sept. *Culms* 8 to 20 inches high, at first mostly simple, bearing a more or less exserted compound spreading panicle, 1 to 3 inches long. *Leaves* lanceolate, flat, the radical tufted ones, ovate-lanceolate, very short, thickish. *Panicle* changing its form, often purplish. A very variable species, embracing P. nodiflorum, pubescens, laxiflorum, and nitidum of *Lam.* P. barbulatum and ramulosum of *Michx.*

13. P. DEPAUPERATUM, Muhl. *Few-flowered Panic-grass.*

Panicle simple, contracted, few-flowered, often over-topped by the narrowly linear upper leaves; *spikelets* oval-obovate, commonly pointed when young; *lower glume* ovate, ⅓ the length of the 9-nerved upper one.

Dry woods and hills, common. June. *Culms* simple or branched at the base, forming close tufts, 6 to 12 inches high. *Leaves* short, becoming longer above, narrow-linear, hairy beneath. *Panicle* 4 to 7 inches long. Varies with the leaves often involute.

14. P. VERRUCOSUM, Muhl. *Warty Panic-grass.*

Smooth; *panicle* capillary, widely spreading, few-flowered; *spikelets* oval, acute, warty-roughened, dark green; *lower glume* ¼ the length of the upper one.

Sandy swamps. Aug., Sept. *Culm* 1 to 2 feet high, branching and spreading, very slender, naked above. *Leaves* narrow, smooth, spreading.

15. P. CRUS-GALLI, L. *Barnyard-grass.*

Spikes alternate, crowded in a dense panicle; *glumes* ovate, abruptly pointed; *lower paleæ* of the neutral flower bearing a rough awn of variable length.

Wet places, near barn-yards. Aug., Sept. Ann. *Culm* 2 to 4 feet high, terete, smooth, stout, branching from the base. *Leaves* lanceolate, ½ inch or more wide, rough-margined. *Spikes* 1 to 3 inches long.

43. SETARIA, Beauv. BRISTLE-GRASS.

Lat. *seta*, a bristle; in allusion to the bristly spikelets.

SPIKELETS 2-flowered, invested with an involucre of 2 or more bristles. GLUMES 2, unequal, herbaceous. LOWER FLOWER abortive; PALEÆ 1 or 2, herbaceous. UPPER FLOWER perfect; PALEÆ cartilaginous.—*Annuals, with linear or lanceolate flat leaves, and the inflorescence in a dense spiked panicle or apparently a cylindrical spike.*

1. S. VERTICILLATA, Beauv. *Rough Bristle-grass.*

Spike subverticillate, cylindrical, somewhat interrupted; *bristles* short; *paleæ* of the perfect flower roughish-punctate.

Naturalized near dwellings. July. *Culm* about 2 feet high, smooth. *Leaves* lanceolate, acuminate, rough on the margin. *Spike* 2 to 3 inches long, green.

2. S. GLAUCA, Beauv. *Bottle-grass.*

Spike cylindrical, very dense; *bristles* 6 to 11 in a cluster, much longer than the spikelets; *perfect flower* transversely wrinkled,

Very common in stubble. July, Aug. *Culm* 2 to 3 feet high. *Leaves* lanceolate, hairy at base. *Spike* 2 to 4 inches long, tawny or orange-yellow. Introduced.

3. S. VIRIDIS, Beauv. *Green Foxtail.*

Spike nearly cylindrical, more or less compound; *bristles* few in a cluster, longer than the spikelets; *perfect flower* striate lengthwise and dotted.

Cultivated grounds, common. July, Aug. *Culm* 2 to 3 feet high, erect. *Leaves* linear, flat, roughish. *Spike* 2 to 3 inches long, green.

4. S. ITALICA, Kunth. *Italian Bristle-grass.*

Spike compound, interrupted at the base, thick, nodding; *bristles* 2 or 3 in a cluster, either longer or shorter than the spikelets.

Wet grounds, sparingly naturalized and sometimes cultivated under the name of *Billet* or *Bengal Grass*. *Culm* 4 feet high. *Spike* 6 to 9 inches long, yellowish or purplish.

44. TRIPSACUM, Linn. SESAME-GRASS.

Gr. *tribo*, to rub; perhaps in allusion to the polished fertile spikes.

Monœcious. STERILE SPIKELETS above, in pairs on each joint of the rachis, collateral, 2-flowered: FLOWERS each with 2 paleæ. FERTILE SPIKELETS solitary, as long as the joint, 2-flowered; the flowers with 2 paleæ; the outer or lower flower neutral, the inner or upper one fertile. STYLES united: STIGMAS very long, hairy, purple. GRAIN ovoid, free.—*Culms stout and tall. Leaves broad and flat. Spikes axillary and terminal, seperating into joints at maturity.*

T. DACTYLOIDES, L. *Sesame-Grass. Gama-Grass.*

Spikes 2 or 3 together at the summit, and solitary from the upper sheaths.

Meadows. July, Aug. Per. *Culm* erect or oblique, 4 to 6 feet high. *Leaves* large, often 3 feet long, linear-lanceolate, smooth beneath, rough above. *Spikes* 4 to 8 inches long.

45. ANDROPOGON, Linn. BEARD GRASS.

Gr. *aner*, a man, and *pogon*, a beard, in allusion to the hairy flowers.

SPIKELETS in pairs upon each joint of the slender rachis, spiked or racemed. LOWER FLOWER staminate or neutral, the glumes and palea very minute or wanting. UPPER FLOWER perfect. GLUMES awnless. PALEA 2, shorter than the glumes; lower one mostly awned. STAMENS 1 to 3. GRAIN free.—*Coarse and rough perennial Grasses, with lateral or terminal spikes commonly clustered or digitate, the rachis hairy or plumose bearded.*

1. A. FURCATUS, Muhl. *Forked Beard-Grass.*

Spikes digitate, mostly in threes or fours; lower flower staminate, awnless; *awn* of the perfect flower bent.

Sterile soils, common. Sept. *Culm* 3 to 4 feet high. *Leaves* flat, the lower very long. *Spikes* 3 inches long, 3 to 6 at the naked summit of the culm.

2. A. SCOPARIUS, Michx. *Purple Beard-Grass.*

Spikes simple, lateral and terminal, pedunculate, in pairs; *lower flower* neutral, awned; *glumes* of the perfect flower smooth; *awn* twisted.

Old fields and roadsides. Aug. *Culm* 3 to 4 feet high, slender, with many paniculate branches. *Leaves* flat, hairy. *Spikes* on a flexuous rachis, often purple.

3. A. VIRGINICUS, L. *Virginian Beard-Grass.*

Culm flattish below, sparingly short-branched above; *sheaths* smooth; *spikes* 2 or 3 together in distant appressed clusters.

Sandy soil. Sept. *Culms* about 3 feet high, somewhat tufted. *Leaves* a foot or more long. *Spikes* 1 inch long, partly concealed in sheaths.

46. SORGHUM, Pers. BROOM-CORN.

The Asiatic name of a cultivated species.

SPIKELETS 2 or 3 together on the branches of an open panicle, the lateral ones sterile or often reduced merely to their pedicels; the middle or terminal one only fertile, its glumes coriaceous or indurated, sometimes awnless. PALEÆ 3, the upper one awned. STAMENS 3.

1. S. NUTANS, Gray. *Indian Grass. Wood Grass.*

Panicle narrowly oblong, rather crowded, the perfect spikelets at length drooping, clothed near the base with fawn-colored hairs, shorter than the twisted awn *sterile spikelets* small and very imperfect, or reduced to a mere plumose-hairy pedicel.

Dry soil. Aug. Per, *Culm* simple, 3 to 5 feet high, terete. *Leaves* linear-lanceolate, glaucous. *Panicle* 6 to 12 inches long, the spikelets bright russet brown and shining.

2. S. SACCHARATUM, L. *Broom Corn.*

Culm 6 to 10 feet high, thick, solid with pith; *leaves* lanceolate, acuminate, pubescent at base; *panicle* large, diffuse, with long verticillate at length drooping branches; *glumes* of the perfect spikelet hairy, persistent. Ann. From the East Indies. Much cultivated.

3. S. VULGARE, L. *Indian Millet.*

An annual from the East Indies, is rarely cultivated as a curiosity, or for the seed for food for poultry.

47. ZEA, L. INDIAN CORN.

Gr. *Zao,* to live; the seeds contributing eminently to the support of life.

Monœcious. STAMINATE FLOWERS in terminal paniculate racemes: SPIKELETS 2-flowered: GLUMES 2, herbaceous, obtuse, subequal: PALEA membranaceous, awnless, obtuse. PISTILLATE FLOWERS lateral, axillary, on a spadix enclosed in a spathe of numerous bracts: SPIKELETS 2-flowered, 1 flower abortive: GLUMES 2, very obtuse: PALEA awnless: STYLE 1, filiform, very long, pendulous. SEED compressed.

Z. MAYS, L. *Maize. Indian Corn.*

Root fibrous, often with aerial roots; *culm* erect 5 to 15 feet high, channelled on one side, leafy; *leaves* lance-linear, entire, 2 to 3 feet long. Annual. Native of the warm latitudes of America. Very extensively cultivated throughout the temperate and torrid zones. Varieties numerous.

48. COIX, Linn. JOB'S TEAR.

Koix, a palm-leaved tree.

STAMINATE FLOWERS, in remote spikes; GLUMES 2-flowered, awnless. STYLE 2-parted. SEED covered with the bone-like calyx.

C. LACHRYMA, L. *Job's-Tear.*

Culm semi-terete above; *flowers* naked; *fruit* ovate. June. Ann. A curious grass, often cultivated for its seeds, which much resemble beeds.

ADDITIONS.

To Order 39. ROSACEÆ, after Dalibarda, page 103, add

Tribe III. Fragarieæ.—*The Strawberry Tribe.*

POTENTILLA, Linn. Cinque-foil. Five-Finger.

Lat. *potens*, in allusion to its supposed medicinal virtues.

Calyx deeply 5-cleft, with 5 bractlets at the sinuses, appearing 10-cleft. Petals 4 or 5, roundish or inversely heart-shaped, deciduous. Stamens numerous. Achenia many, collected in a head on the hairy receptacle.—*Herbs, or rarely shrubs, with compound leaves, and solitary or cymose flowers.*

* *Leaves palmate: leaflets 3 to 5: flowers yellow.*

1. P. Canadensis, L. *Common Cinque-foil or Five-finger.*

Hairy or pubescent, procumbent and ascending, producing runners; *peduncles* axillary, elongated, 1-flowered; *leaflets* 5, oblong or obovate-wedge-form, cut-toothed towards the apex; *petals* longer than the calyx.

Dry fields, among grass, very common. April—Oct. Per. *Stems* at length 12 to 18 inches long. *Leaves* white villous when young. *Flowers* yellow. A very variable species, embracing several varieties. Var. 1. PUMILA is a dwarf early flowering state in sterile soil. Var. 2. SIMPLEX is a taller and greener state, with slender ascending stems. (P. simplex, *Michx.*)

2. P. argentea, L. *Silvery Cinque-foil.*

Low; *stems* ascending, cymose at the summit, many-flowered, white-woolly; *leaflets* 5, wedge-oblong, almost pinnatifid, entire towards the base, with revolute margins, green above, silvery-white-woolly beneath; *petals* longer than the calyx.

Dry barren fields. June—Sept. Per. *Stems* 4 to 10 inches long, somewhat woody at base, at length with slender branches. *Leaflets* ½ to ¾ inch by ⅛, with 2 or 3 slender spreading teeth on each side; upper ones linear entire. *Flowers* small, yellow.

3. P. Norvegica, L. *Norway Cinque-foil.*

Hairy, erect, forked above, many-flowered; *leaflets* 3, obovate-oblong, coarsely cut-serrate; *calyx* longer than the petals; *achenia* wrinkled or ribbed.

Old fields and pastures. July—Sept. Ann. or Bien. *Stem* 1 to 2 feet high, hirsute, at length more or less branched. *Lower leaves* on petioles 1 to 4 inches long. *Flowers* pale yellow, in leafy corymbs at the top, and on long solitary peduncles below.

* * *Leaves odd-pinnate: flowers yellow.*

4. P. arguta, Pursh. *Close-flowered Cinque-foil.*

Stem erect, tall and stout, brownish-hairy, clammy towards the summit; *leaves* pinnate, the lowest 7 to 9, the upper 3 to 7-foliate; *leaflets* oval or ovate, incised or doubly serrate, downy underneath; *flowers* cymose-clustered.

Rocky hills and banks. July. Per. *Stem* mostly simple, 2 to 4 feet high. *Radical leaves* 1 foot or more long. *Leaflets* 1 to 2 inches long, ⅔ as wide, sessile. *Flowers* about ¾ inch in diameter, yellowish-white.

5. P. FRUTICOSA, L. *Shrubby Cinque-foil.*

Stem erect, very much branched, bushy; *leaves* pinnate; *leaflets* 5 to 7, crowded, oblong-lanceolate, entire, silky, especially beneath; *stipules* lanceolate, scale-like; *flowers* numerous, terminating the branchlets.

Margins of swamps, rare. June—Sept. A shrub 2 to 4 feet high, with a reddish bark, and numerous branches. *Leaves* numerous, on short petioles. *Flowers* numerous, large, yellow. Cultivated.

FRAGARIA, Tourn. STRAWBERRY.

Lat. *fragrans*, fragrant; on account of its perfumed fruit.

CALYX concave, deeply 5-cleft, with an equal number of alternate exterior segments or bracteoles. PETALS 5, obcordate. STAMENS numerous. STYLES deeply lateral. RECEPTACLE in fruit much enlarged and conical, becoming pulpy and whitish or scarlet, bearing the minute dry achenia, scattered over its surface.—*Low perennials, with runners, radical 3-foliate leaves, and white cymose flowers on scapes.*

1. F. VIRGINICA, Ehrh. *Wild Strawberry.*

Leaflets broad-oval, smoothish above, the lateral ones distinctly petioled; *peduncles* mostly shorter than the leaves; *achenia* imbedded in the deeply pitted ovoid receptacle.

Banks and rocky places. April, May. Fruit in June, July. *Petioles* radical, 2 to 6 inches long, with spreading hairs. *Leaflets* coarsely toothed, 1 to 2 inches long, ¾ as wide.

2. F. VESCA, L. *Common Strawberry.*

Leaflets folded, thin; *peduncles* usually longer than the leaves; *achenia* superficial on the conical or hemispherical receptacle (not sunk in pits).

Fields and meadows, common. April, May. Fruit June, July. *Stolens* often creeping several feet. Numerous varieties are cultivated.

To ORDER 35. RHAMNACEÆ, after Rhamnus, p. 74, add

2. CEANOTHUS, Linn. NEW JERSEY TEA.

An ancient Greek name applied to this genus.

CALYX 5-lobed, the lower part adhering with the ovary, the upper seperating across in fruit. PETALS hood-form, on slender claws. FILAMENTS elongated. FRUIT 3-lobed, dry and splitting into its 3 carpels when ripe.—*Shrubby plants, with entire leaves, and small white flowers in little umbel-like clusters, which are crowded in dense panicles or corymbs at the summit of naked flower branches.*

C. AMERICANUS, L. *New Jersey Tea. Red-root.*

Leaves ovate or oblong-ovate, 3-ribbed, serrate, downy beneath, often heart-shaped at the base; *common peduncles* elongated, nearly leafless.

Dry woodlands and fence-rows, common. July. An undershrub 1 to 3 feet high from a dark red root, with downy branches and numerous small flowers, in pretty white clusters.

ERRATA.

Generic description of Nasturtium on page 23 should read.—Pod nearly terete, &c.—see Class 14, Tetradynamia, Order 2, Siliquosæ, in Analytical Tables.

On page 36, 3d line, after Cleome for on, read or.

Page 73, 6th line, from Euonymus for 5-sided, read 4-sided.

Page 87, for Lespedza, read *Lespedeza.*

Page 103, 2nd line from bottom, for stick, read disk.

Page 112, 4th line after Decoden, for stamens 15, read stamens 10.

Page 220, 4th line after Chimaphila, for stamens 19, read stamens 10.

Page 232, 2nd line after Tecoma, for 6-toothed, read 5-toothed.

Page 281, 4th line after Datura, for petioled, read plaited.

INDEX

TO

BOTANICAL NAMES.

The names of the Orders and Sub-orders are in SMALL CAPITALS, the Genera and Sub-genera in Roman, and the Synonymes in *Italic*.

PAGE.
Abies 340
Abietineæ 339
Abrotànum 190
Absínthium 190
Abùtilon 69
Acálypha 317
ACANTHACEÆ 234
Acer 69
ACERACEÆ 69
Acetósella 307
Achillèa 188
Acnìda 299
Aconìtum 10
Actæa 10
Actinómeris 184
Adenorachis 110
Adlùmia 24
Adònis 12
Æschynómene 84
Æsculus 71
Agàve 365
AGLUMACEOUS ENDOGENS 345
Agrimònia 101
Agróstis 411
Agropỳrum 422
Aira 424
Alètris 367
Alisma 353
ALISMACEÆ 352
ALISMEÆ 353
Allium 379
Alnus 328
Aloíneæ 384
Alopecùrus 409
Alsineæ 50
Althèa 58
Alỳssum 27
Amalánchier 109
AMARANTHACEÆ 300
Amaránthus 300
AMARYLLIDACEÆ 365
Amarỳllis 365
Amberboa 196
Ambrósia 177
Amiánthium 387
Amórpha 90
Ampelópsis 75
Amphicárpa 83
Amphiotis 153
AMYGDALEÆ 96
Amỳgdalus 99
ANACARDIACEÆ 87

PAGE.
Anagállis 228
ANAGALLIDEÆ 228
Anchùsa 270
Andròmeda 213
ANDROMEDEÆ 212
Andropògon 431
Anemòne 2
ANGIOSPERMOUS EXOGENS 1
ANONACEÆ 14
Anthemis 187
Anthóxanthum 427
Antennària 191
ANTIRRHINIDEÆ 235
Antirrhìnum 236
Anỳchia 54
APETALOUS EXOGENOUS PLANTS 296
Aphỳllon 232
Ápios 32
Apium 139
Apléctrum 357
APOCYNACEÆ 289
Apocỳnum 289
AQUIFOLIACEÆ 221
Aquifolium 222
Aquilègia 8
Arabis 20
ARACEÆ 345
Arália 142
ARALIACEÆ 142
Archémora 138
Archangélica 184
Arenària 52
Arethùsa 361
Argemòne 21
Aristìda 414
Aristolóchia 297
ARISTOLOCHIACEÆ 297
Armèria 225
Armeniaca 97
Árnica 195
Artemìsia 190
rum 345
Àsarum 297
ASCLEPIADACEÆ 290
Asclèpias 290
Ascyrum 45
Asímina 15
ASPARAGEÆ 374
Aspáragus 374
ASPHODELEÆ 377
Asphòdelus 378

PAGE.
Aster 162
ASTEROIDEÆ 161
Astràgalus 89
Atheropògon 415
Átropa 284
Avèna 426
Avicularia 305
Azàlea 216

BALSAMIFLUÆ 333
BALSAMINACEÆ 64
Baptìsia 93
Barbàrea 29
Bartònia 287
Batàtus 279
Bénzoin 308
BERBERIDACEÆ 16
Bérberis 16
Bèta 300
Bètula 327
BETULACEÆ 327
Bídens 183
BIGNONIACEÆ 233
BIGNONEÆ 233
Biòttia 162
Blephìlea 253
Blitum 299
Bœhmèria 328
Boltònia 169
BORAGINACEÆ 266
Boràgo 270
Brachyelỳtrum 418
Brasènia 17
Bràssica 34
Brìza 417
Bròmus 421
Broussonétia 335
Buchnèra 244
Bupleùrum 136
Bùxus 318

CABOMBACEÆ 17
Cacàlia 193
CACTACEÆ 118
CÆSALPINEÆ 94
Calamagróstis 413
Caléndula 196
Cálla 349
Calliastrum 162
Callístephus 170
CALLITRICHACEÆ 313
Callítriche 314
Calopògon 361

PAGE.
Cáltha 7
CALYCANTHACEÆ 111
Calycánthus 111
Calystègia 257
Camelina 26
Campànula 203
CAMPANULACEÆ 208
CAMPTYLOSPERMÆ 140
Cánna 364
Cánnabis 336
CANNABINEÆ 336
CANNACEÆ 364
CAPPARIDACEÆ 35
Caprifolium 145
Capsèlla 25
Cápsicum 284
Cardàmine 31
Cardiospérmum 70
Càrex 403
Carpìnus 325
Cárthamus 199
Càrum 138
Càrya 319
CARYOPHYLLACEÆ 47
Cassandra 214
Cássia 94
CASSIEÆ 94
Castànea 323
Castillèja 245
Catanánche 206
Catálpa 233
Cataria 255
Caulinia 350
Cedronélla 255
CELASTRACEÆ 71
Celástrus 72
Celòsia 302
Céltis 312
Centaùrea 195
Centròsema 83
Cephalánthus 152
Cerástium 51
Cèrasus 97
CERATOPHYLLACEÆ 313
Ceratophýllum 313
Ceratoschœnus 401
Cércis 94
Chaerophýllum 140
Chamælirium 388
Cheiránthus 33
Chelidònium 21
Chelòne 237
CHENOPODIACEÆ 298
Chenopòdium 298
Chimàphila 220
CINCHONEÆ 152
Chionanthes 295
Chrysópsis 174
Chrysánthemum 189
Chrysosplénium 129
Cicer 80
CICHORACEÆ 200
Cichòrium 200
Cicùta 126
Cimicifuga 11
Cinna 411
Circæa 116
Cirsium 196

CISTACEÆ 40
Cládium 402
Claytònia 56
Clèmatis 2
Cleòme 36
Clèthra 215
Clintònia 376, 267
Clinopòdium 258
Cnicus 199
Cochleària 26
Cœlospermæ 141
Còix 432
Collinsia 297
Collinsonia 252
Comàndra 310
Commelýna 392
COMMELYNACEÆ 392
Comptònia 327
COMPOSITÆ 155
CONIFERÆ 329
Cònium 141
Conoclinum 158
Conophòlis 231
Convallària 377
Convólvulus 278
CONVOLVULACEÆ 277
Cóptis 8
Coprosmanthus 372
Corallorhiza 357
Coreópsis 182
Coriándrum 142
CORNACEÆ 144
Córnus 144
Corýdalis 23
Còrylus 324
Cosmanthus 273
Crántzia 132
CRASSULACEÆ 125
Crataègus 108
Cròcus 373
Crotalària 93
CRUCIFERÆ 24
Cryptotænia 137
Cùcumis 123
Cucùrbita 124
CUCURBITACEÆ 121
Cùnila 252
Cuphèa 113
CUPRESSINEÆ 342
Cupréssus 342
CUPULIFERÆ 320
CUSCUTINEÆ 279
Cuscùta 279
Cydònia 111
Cynoglóssum 269
CYNAREÆ 195
Cýnthia 201
Cýnodon 415
CYPERACEÆ 395
Cypripèdium 363
Cýperus 395

Dáctylis 416
Dàhlia 170
Dalibárda 108
Danthònia 426
Dáphne 309
Daùcus 133

PAGE.
Datùra 281
Décodon 113
Delphìnum 9
Dentària 28
Desmòdium 85
Diánthus 47
Dianthèra 274
Dicéntra 23
DICOTYLEDONS 1
Diervilla 146
Digitàlis 237
Dioscòrea 371
DIOSCOREACEÆ 371
Diospýros 223
Diplopáppus 168
DIPSACEÆ 154
Dipsacus 155
Diptericánthus 284
Dirca 308
Dodecàtheon 227
Dracocéphalum 256
Dròsera 42
DROSERACEÆ 42
DRYADEÆ 101
Dulichium 395

EBENACEÆ 223
Echinocýstis 122
Echinospèrmum 269
Echinodorus 354
Èchium 266
Eclipta 175
ELATINACEÆ 46
Elatine 46
Eleocharis 397
Elephantopus 156
Eleusine 415
Èlymus 428
Elódea 48
ENDOGENS 345
Epigæa 213
Epilòbium 113
Epiphègus 251
Eragróstis 418
Erechthites 182
ERICACEÆ 210
ERICINEÆ 212
Erigènia 141
Erigeron 167
Eriocaùlon 394
ERIOCAULONACEÆ 394
Eriòphola 25
Eriòphorum 400
Erýsimum 32
Erythræa 286
Erythrònium 382
ESCALLONIEÆ 129
Escholtzia 22
EUONYMEÆ 73
Euònymus 73
EUPATORIACEÆ 157
Eupatòrium 159
Euphórbia 315
EUPHORBIACEÆ 315
Eutòca 273
ÉXOGENS 1

Fàba 30

	PAGE.
Fagopyrum	306
Fàgus	324
Fèdia	154
Festùca	420
Filàgo	192
Fimbristỳlis	400
Flœrkia	66
Fœniculum	139
Fráxinus	295
Fragària	434
Frittillària	383
Fumària	24
FUMARIACEÆ	22
Funkia	378
Galáctia	82
Galánthus	366
Galatélla	166
Galeópsis	262
Gàlium	151
Gaùra	115
Gaulthèria	212
Gaylussacia	210
Gentiàna	287
GENTIANACEÆ	285
GERANIACEÆ	62
Gerànium	62
Gerárdia	244
Gèum	102
Gillia	276
Gillènia	100
Glechòma	256
Gledìtschia	95
GLUMACEÆ	395
GLUMACEOUS ÉNDOGENS	395
Glycèria	418
Gnaphàlium	191
Gomphrèna	302
Gonólobus	293
Goodyèra	362
GRAMINEAE	408
Gratiòla	240
GROSSULACEÆ	119
Gymnadènia	359
GYMNOSPERMOUS ÉXOGENS	339
Gynandrópsis	65
HALORAGEÆ	116
HAMAMELACEÆ	131
Hamamèlis	131
Hedeòma	252
Hèdera	143
Hedỳotis	158
HEDYSAREÆ	84
Hedỳsarum	84
HELIANTHEÆ	354
Helènium	186
HELIANTHEÆ	178
Heliánthemum	40
Helianthus	180
Heliópsis	179
Hellèborus	12
Helònias	388
Helxine	305
Hemiánthus	241
Hemicárpha	397
Hemerocállis	377
Hepàtica	3
Heràcleum	134
Herpèstis	240
Hésperis	34
Heteránthera	391
Heuchèra	127
Hibíscus	58
Hieràceum	202
Hippùris	118
HŒMODORACEÆ	367
Hólcus	426
Hórdeum	424
Hottònia	229
HOTTONIEAE	229
Houstonia	153
Hudsònia	41
Hùmulus	336
Hyacinthus	380
Hydrángea	130
HYDRANGEAE	130
Hydrástis	7
Hydrocòtyle	131
HYDROCHARIDACEAE	354
HYDROPHYLLACEAE	271
Hydrophyllum	271
Hyoscỳamus	281
HYPERICACEAE	43
Hypèricum	44
Hypophorum	403
Hypòxis	366
Hyssòpis	265
Ibèris	27
Ilex	222
Ilysánthus	241
Impàtiens	64
Inula	175
Iodánthus	30
Ipomœa	278
Ipomópsis	277
IRIDACEÆ	368
Iris	368
Isánthus	249
Isàtis	28
Isnarda	116
Itea	129
JASMINACEAE	294
Jasminum	294
Jeffersònia	17
JUGLANDACEÆ	318
Jùglans	318
JUNCACEÆ	388
JUNCAGINEÆ	352
Júncus	389
Junìperus	343
Justicia	234
Kálmia	217
Kœlèria	416
Krìgia	201
Kùhnia	158
LABIATÆ	249
Lactùca	204
Lagenària	124
Làmium	261
Láppa	198
Lapathum	306
Laportea	337
Làrix	341
Làthyrus	78
LAURACEAE	307
Laurus	308
Lavèndula	264
Lèchea	41
Lèdum	218
Leèrsia	408
LEGUMINOSÆ	77
Lémna	348
LEMNACEÆ	348
Lentago	149
LENTIBULACEÆ	230
Leóntice	17
Leóntodon	201
Leonùrus	261
Lèpachys	180
Lepìdium	26
Leptandra	242
Lespedéza	87
Leucánthemum	188
Leucòjum	367
Liàtris	157
LIGULIFLORAE	200
Ligústrum	294
LILIACEAE	374
Lìlium	381
LIMNANTHACEAE	66
Limosélla	241
LINACEAE	61
Linaria	236
Lindernia	241
Linnaèa	148
Linum	61
Lìparis	356
Lippia	249
Liquidámber	383
Liriodendron	14
Listèria	368
Lithospérmum	267
Lobèlia	206
LOBELIACEAE	206
LOGANEAE	153
Lòlium	423
Lonicera	145
LONICEREAE	145
Lopháuthus	256
LORANTHACEAE	311
LOTEAE	89
Ludwigia	115
Lunària	27
Lupinus	93
Lùzula	389
Lỳchnis	50
Lỳcium	284
Lycopèrsicum	283
Lycópsis	266
Lycòpus	251
Lyònia	214
Lysimáchia	227
LYTHRACEAE	112
Maclùra	336
Magnòlia	13
MAGNOLIACEAE	13
Maianthemum	376

PAGE.
Màlus 110
Málva 57
MALVACEÆ 57
Malaxis 356
Mària 214
Marrùbium 363
Martŷnia 233
Marùta 187
Matthìola 34
Meconópsis 20
Medèola 374
Medicàgo 92
MELANTHIEAE 386
Melànthium 386
Melampŷrum 247
MELASTOMACEÆ 111
Mélica 417
Melilòtus 92
Melíssa 258
Melòthria 122
MENISPERMACEÆ 15
Menispérmum 15
Méntha 250
Menyánthus 288
Menziésia 215
Merténsia 263
Mikània 158
Micróstylus 356
Mìmulus 239
Miràbilis 302
Mitchélla 152
Mitélla 128
Mollúgo 53
Momórdica 123
Monárda 253
MONOCOTYLEDONS 345
MONOPETALOUS EXOGENS 145
Monòtropa 221
MONOTROPEAE 220
MOREAE 334
Mòrus 335
Muhlenbérgia 412
Mulgèdium 204
Myosòtis 268
Myrìca 326
MYRICACEAE 326
Myriophŷllum 117

Nàbulus 202
NAIADACEAE 350
Nàias 350
Narcissus 366
Nardósmia 161
Nasturtium 29
Negúnda 70
NELUMBIACEAE 18
Nelúmbium 18
Nemopánthes 223
Nemòphila 273
Nèpeta 255
Nicándra 282
Nicotiana 280
Nigélla 13
NYCTAGINACEAE 302
Nymphæa 18
NYMPHÆACEAE 18
Nùphar 19
Nyssa 309
PAGE.
NYSSACEÆ 309

Obolària 289
Ocŷmum 264
Œnothèra 114
OLEACEÆ 294
ONOGRACEÆ 113
Onopórdon 198
Onosmòdium 267
Opulus 150
Opúntia 119
ORCHIDACEÆ 356
Orchis 358
Orìganum 251
Ornithògalum 378
OROBANCHACEÆ 231
Orobanche 231
Oróntium 347
Orthomeris 166
ORTHOSPERMÆ 131
Osmorhiza 140
Ostrya 325
OXALIDACEÆ 63
Oxalis 63
Oxydendron 214
Oxycoccus 212
Oxytripolium 166

Pæònia 12
Pànax 143
Pànicum 427
Pàpaver 21
PAPAVERACEÆ 29
PAPILIONACEÆ 77
Pardánthus 370
Parietària 338
Parnássia 43
PARNASSIEÆ 43
Passiflòra 121
PASSIFLORACEÆ 121
Pastinàca 134
Paulònia 238
Pediculàris 246
Peltándra 346
Penthòrum 126
Pentstémon 238
Pérsica 98
Pèrsicaria 304
Petúnia 285
Phacèlia 272
PHANOGAMIA 1
Phàlaris 427
Pharbìtis 278
PHASEOLEAE 81
Phaséolus 81
PHILADELPHEÆ 130
Philadelphus 130
Phlèum 409
Phlóx 274
Phragmìtes 422
Phrŷma 245
Phyllánthus 317
Phŷsalis 282
Physostégia 261
Phytoláccа 303
PHYTOLACCACEÆ 303
Pìlea 338
Pimpinélla 139
PAGE.
Pìnus 339
Pìsum 80
PLANTAGINACEÆ 224
Plantàgo 224
PLATANACEÆ 334
Platanthèra 359
Plàtanus 334
Plùchia 175
PLUMBAGINACEAE 225
Pòa 418
Podophŷllum 16
PODOSTEMACEÆ 314
Podostémum 314
Pogònia 361
Polanŷsia 35
POLEMONIACEÆ 274
Polemònium 276
Polyánthos 381
POLYGONACEÆ 303
Polŷgala 76
POLYGALACEÆ 75
Polygonàtum 375
Polŷgonum 303
Polŷmnia 176
POLYPETALOUS EXOGENS 1
POMEÆ 108
Pontedèria 391
PONTEDERIACEÆ 391
Pòpulus 332
Portulàca 56
PORTULACACEÆ 55
Potentílla 433
Potèrium 102
Prìmula 226
PRIMULACEÆ 225
PRIMULEæ 226
Prinoides 222
Prìnos 222
Prosártes 385
Proserpinàca 117
Prunélla 259
Prùnus 96
Ptèlea 67
Pteróspora 220
Pulmonària 271
Pycnánthemum 257
Pŷrceus 396
Pyrèthrum 189
Pŷrola 219
Pyròleae 218
Pyrulària 310
Pŷrus 109

Quamoclit 279
Quèrcus 320

RANUNCULACEÆ 1
Ranúnculus 4
Ràphanus 33
Reboúlea 417
Reséda 36
RHAMNACEÆ 73
Rhámnus 73
Rhèum 307
Rhéxia 111
RHINANTHIDEÆ 241
Rhododèndron 217
Rhodòra 216

PAGE.
RHODOREÆ 215
Rhús 67
Rhynchóspora 401
Ríbes 119
Rícinus 318
Robinia 89
Ròsa 105
ROSACEÆ 96
ROSACEÆ, proper 99
Rosemarínus 265
RUBIACEÆ 150
Rùbus 103
Rudbèckia 179
Ruellia 234
Rùmex 306

Sabbàtia 285
Sagìna 53
Sagittària 354
SALICACEÆ 329
Sàlix 329
Sálvia 254
SAMBUCEÆ 148
Sambùcus 148
SAMOLEÆ 229
Samòlus 229
Sanìcula 133
Sanguinària 29
Sanguisòrba 101
SANTALACEÆ 310
SAPINDACEÆ 70
Saponària 48
Sarracènia 19
SARRACENIACEÆ 19
Sássafras 308
Saturèja 265
SAURURACEÆ 313
Saurúrus 313
SAXIFRAGACEÆ 126
Saxìfraga 127
SAXIFRAGEÆ 127
Scabiòsa 155
Scheuchzeria 353
Schóllera 392
Schwálbea 246
Scírpus 398
Scleránthus 55
Sclèria 402
SCROPHULARIACEÆ 235
Scutellària 259
Sècale 425
Sèdum 125
Senècio 194
SENECIONOIDEÆ 176
Sericocárpus 169
SESAMEÆ 233
Setària 430
Sìcyos 122
Sìda 60
Silène 47
SILENEÆ 47
SILICULOSÆ 25
SILIQUOSÆ 28
Sílphium 177
Sinàpis 32
Sisýmbrium 31
Sisyrínchium 369
Sìum 137
SMILACEÆ 371

PAGE.
Smilacìna 375
Smìlax 372
SOLANACEÆ 280
Solànum 283
Sòlea 40
Solidàgo 171
Sónchus 205
SOPHOREÆ 93
Sórbus 110
Sórghum 431
Spargànium 349
Spartìna 414
Speculària 209
Spérgula 54
Spergulària 55
Spigélia 154
Spiræa 99
SPIRÆEÆ 99
Spiránthus 362
Sporòbolus 410
Stáchys 262
Staphỳlea 72
STAPHYLEÆ 72
Stàtice 225
Stellària 51
STELLATÆ 151
Stìpa 413
Streptòpus 386
Stylosànthes 88
Symphoricárpus 147
Sýmphytum 266
Symplocárpus 346
Syringa 295

Tàgetes 184
Talìnum 57
Tanacètum 189
Taráxicum 203
TAXINEÆ 344
Taxòdium 343
Tàxus 344
Tecòma 232
Tephròsia 90
Teùcrium 264
Thalíctrum 3
Tháspium 135
Thláspi 25
Thunbèrgia 235
Thùja 342
THYMELEACEÆ 308
Thỳmus 258
Tiarélla 128
Tìlia 61
TILIACEÆ 60
Tillæà 125
Tipularia 358
Tradescántia 393
Tragopògon 205
Trichelostỳlus 400
Trichòdium 411
Tricòphorum 399
Trichóstema 263
Tricúspis 416
Trientàlis 227
Trifòlium 90
Triglóchin 352
TRILLIACEÆ 373
Tríllium 373
Triòsteum 147

PAGE.
Trípsacum 430
Trisètum 425
Tríticum 422
Tróllius 8
TROPÆOLACEÆ 65
Tropæolum 65
TUBULIFLORÆ 156
Tùlipa 383
TULIPACEÆ 381
TUSSILAGINEÆ 161
Tussilàgo 161
Tỳpha 348
TYPHACEÆ 348

Udòra 354
ULMACEÆ 311
Ulmus 311
UMBELLIFERÆ 131
Unìola 421
Urtica 337
URTICACEÆ 334
URTICEÆ 337
Uvulària 384
UVULARIEÆ 384

VACCINEÆ 210
Vaccìnium 210
VALERIANACEÆ 154
Vallisnèria 355
Veràtrum 387
Verbáscum 235
Verbèna 247
VERBENACEÆ 247
Verbesina 186
Vernònia 156
VERNONIACEÆ 156
Verònica 242
Vibúrnum 149
Vìcia 77
VICIEÆ 77
Vìlfa 410
Vínca 220
Vìola 37
VIOLACEÆ 36
Vìscum 311
VITACEÆ 74
Vìtis 74

Waldsteìnia 103
Wistària 83

Xànthium 178
Xeránthemum 200
Xylòsteum 146
XYRIDACEÆ 393
Xỳris 394

Yúcca 384

Zannichéllia 350
Zanthorìza 11
ZANTHOXYLACEÆ 66
Zanthoxỳlum 66
Zapania 249
Zèa 432
Zínnia 183
Zizia 136
Zizània 409

INDEX

TO

COMMON NAMES.

PAGE.
Acánthus Family 234
Adam-and-Eve 357
Adams needle 384
Adders-mouth 356
Agrimony 101
Alder 328
Alexánders 136
Almond 99
Almond Family 96
Aloe 365
Amaránth 300
Amaránth Family 300
Amarýllis 365
Amarýllis Family 365
American Aloe 365
“ Brooklime 242
“ Broomrape 231
“ Centaury 285
“ Cowslip 227
“ Laurel 217
Anise 139
Apple Family 108
Apple of Peru 282
Arbor Vitæ 342
Arethúsa 361
Arrow Arum 346
“ Grass Family 352
“ Grass 352
“ Head 354
Arum 346
Arum Family 345
Asarabácca 297
Ash 295
Aspàragus Tribe 374
Aspen 332
Asphodel 378
Asphodel Tribe 377
Aster, Tribe 161, 162
Avens 102

Bald Cypress 343
Balm 258
Balsam 64
Baneberry 10
Barberry 16
Barley 424
Barn-yard-grass 429
Bartonia 287
Basil 258, 264
Bastard Toad-Flax 310
Bayberry 326
Bay Family 307
Bean Tribe 81
Beard grass 431
PAGE.
Beard-tongue 238
Beak-rush 401
Beech 321
Beech drops 231
Beet 300
Bellflower Family 208
Bellwort, B. Family 384
Bent-grass 411
Bermuda-grass 415
Bignònia Family 233
Bindweed Family 277
Birch Family 327
Birds-nest 220, 221
Birth-root 373
Birthwort Family 297
Blackberry-Lily 370
Black-grass 390
Bladder-nut 72
Bladderwort, B. Family 230
Blazing-Star 388
Blite 299
Bloodwort 20
Bloodwort Family 367
Blue-curls 263
Blue eyed-grass 369
Blue-grass 419
Blue-hearts 244
Bog-rush 389, 402
Borage, B. Family 266, 270
Bottle-brush-grass 421
Bow-wood 316
Box-wood 318
Bracted Bind-weed 277
Bramble, Br. Tribe 101, 103
Bresic 34
Bristle beard-grass 415
Bristle grass 430
Brook-weed 229
Broom-corn 431
Broom-grass 421
Broom-rape, Br. Family 231, 232
Buck bean 288
Buck thorn, B. Family 73
Buckwheat Family 303
Bug-bane 11
Bugle-weed 251
Bugloss 266, 270
Bul-rush 398
Burdock 198
Burr Mary-gold 185
Burr-reed 349
Bush Honey suckle 147
PAGE.
Butter-cup 4
Button-bush 152
Button Snake-root 157
Button-wood 318

Cabbage 34, 346
Cáctus Family 118
Càlamus 347
Calopògon 361
Calico-bush 217
Canary grass 427
Cancer root 231, 232
Candy-tuft 27
Caraway 138
Cardinal-flower 206
Carrion-flower 372
Carrot 133
Catmint 255
Cat-tail Family 348
Cat-tail Flag 348
Cayenne Pepper 284
Celandine 21
Centaury 285, 286
Chaff-seed 246
Chamomile 187
Cheat 421
Cherry 97
Chess 421
Chestnut 323
Chick Pea 80
Chick-weed, Ch. Family 50, 51
Chives 380
Cicily 140
Cinchona Family 152
Cives 380
Cleavers 151
Climbing Fumitory 24
Climbing Hempweed 158
Clintònia 207, 376
Club Golden 347
Club-rush 393
Clòver-trefoil 90
Cockle-burr 178
Cockscomb 303
Columbine 8
Cólchicum Family 386
Colts-fòot 161
Comfrey 269
Coral-root 357
Coriander 142
Corn salad 154
Cord-grass 414
Cotton grass 409

PAGE.
Cotton-rose 192
Cotton thistle 198
Cowbane 138
Cow-parsnip 134
Cowslips 226, 227
Cow-wheat 247
Crab-grass 415, 428
Crane-bill, Cr. Family 62
Crane-fly Orchis 358
Cress 29
Crocus 370
Crow-foot, Cr. Family 1, 4
Crown-beard 186
Crowspur 233
Crown Imperial 383
Cucumber-root 374
Cud-weed 191
Cut-grass 408
Cypress, C. Family 342
Cypress Vine 279

Daffodil 366
Daisy 188
Dandelion 203
Darnel 423
Day-flower 392
Day-Lily 377, 378
Deadly Night-shade 284
Dead Nettle 261
Devils-bit 388
Dielytra 23
Dielytra 23
Dittany 252
Dock 306
Dodder, D. Family 279
Dog-bane, D. Family 289
Dogs tooth-grass 416
Dogs-tooth-violet 382
Dragon-head 256, 261
Dragon-root 346
Drop seed-grass 410, 412
Duck-wèed, D. Family 348
Dutchman's Pipe 297
Dutchman's Breeches 23

Ebony Family 223
Eel grass 375
Elder, E. Tribe 148
Elecampane 175
Elephant's-foot 156
Elm, E. Family 311
Enchanters Night-shade 116
Evening Prim-rose 114
Everlasting 191
Eye-bright 207

False Dragon-head 261
" Flax 26
" Gromwell 267
" Hellebore 387
" Indigo 90, 93
" Jessamine 284
" Nettle 338
" Orchis 359
" Pennyroyal 249
" Pimpernel 241

PAGE.
False Rice 408
" Rocket 30
" Solomon's Seal 375
" Sun flower 186
" Wintergo 219
Fearin grass 411
Feather-foil, F. Tribe 229
Feathergrass 413
Fennel 139
Fern 326, 327
Fescue-grass 428
Fever-few 189
Figwort, F. Family 235, 237
Filbert 324
Finger-grass 428
Fir 240
Fireweed 192
Flax 61
Fleabane 167, 175
Flower de-Luce 368
Flowering Plants 1
Fly Poison 387
Fog-fruit 249
Forget-me-not 268
Four o'clock 302
Fox-glove 239, 245
Fox-tail 409, 430
Fox-tail-grass 409
Fringe-tree 295
Frog's-bit Family 354
Fumitory 24

Gale Family 326
Galingale 395
Gall-of-the-earth 205
Gama-grass 430
Garlic 379
Gentian, G. Family 285, 287
Germander 264
Giant Hyssup 256
Ginseng 143
Globe Amaranth 302
Globe-flower 8
Golden Alexanders 136
" Aster 174
" Club 347
" Rod 171
Gold-thread 8
Gonolobus 293
Gooseberry 120
Goose-foot, G. Family 298
Grass Family 408
Great Burnet 101
Greek Valerian 276
Green Violet 40
Green-brier 372
Gromwell 267
Ground Cherry 282
" Laurel 213
" Love 273
" -nut 82
Groundsel, G. Tribe 176, 194

Hairgrass 411, 424
Hawkbit 201
Hawkweed 202
Hawthorns 108
Hazelnut 324

PAGE.
Heal-all 259
Heath Family 210, 212
Hedge Bind weed 277
" hysup 240
" mustard 31
" nettle 262
Hellebore 387, 12
Hemicarpha 397
Hemlock 126, 141
Hemlock spruce 241
Hemp 336, 299
Hemp Family 336
Hemp-nettle 262
Hemp-weed 158
Henbane 281, 282
Herdsgrass 419, 411
Hickory 319
Holly, H. Family 221, 222
Hollyhock 68
Honewort 17
Honesty 27
Honey-locust 95
Honey-suckle 146
Hop 336
Hop-hornbeam 325
Horehound 261, 263
Hornbeam 325
Horned Pondweed 350
Horned Rush 401
Hornwort, H. Family 313
Horse-balm 252
" nettle 283
" chestnut 71
" mint 253
Houndstongue 269
Hyacinth 380
Hyssup 265, 256

Indian bean 233
" chickweed 53
" cucumber-root 161, 374
" corn 121, 432
" fig 119
" grass 4 1
" hemp 290
" mallow 58
" millet 432
" pine, I. Family 220, 221
" plantain 193
" reed, I. Family 364
" rice 407
" turnip 345
Iris Family 368
Iron weed 156
Iron wood 325
Ivy 143

Jamestown weed 281
Japan day lilies 378
Jasmine, J. Family 294
Jessamine 284
Job's tear 433
Jonquil 366
Judas Tree 94
Juniper 161, 343
June berry 109

Kidneybean 81

PAGE.
Kings spear 278
Knawel 55
Knot weed 303

Labrador Tea 212
Ladies Tresses 862
Lady's Slipper 363
Larch 341
Larkspur 9
Lavender 225, 264
Laurel 213
Leat blossom 161, 317
Leadwort Family 225
Leatherwood 308
Leek 380
Lettuce 204
Lilac 295
Lily 374
Lilly Family 381
Lily of the-valley 377
Lime-grass 423
Linden. L. Family 60, 61
Lion's foot 17
Liverleaf 3
Lizard's-tail, L. Family 313
Lobelia 206
Locust 89
Loose Strife 227
Lopseed 248
Louse wort 246
Lungwort 269, 271
Lupine 93
Lychindia 274
Lymegrass 423

Madder Family 150, 151
Mallow, M. Family 57
Manna-grass 418
Maple 69
Mare's-tail 118
Marigold 164, 185, 199
Marjoram 251
Magnolia 13
Mandrake 16
Mangel-Wurtzel 300
Marsh Marigold 7
Marvel-of-Peru 303
Matrimony Vine 284
May Apple 16
May-weed 187
Meadow Beauty 111
" Sweet 99
" Rue 3
Melilot 92
Melon 121
Mermaid weed 117
Mezereum 309
Mignionette 36
Milfoil 117
Milkweed 290
Milk-wort 76
Milk Pea 82
Milk Vetch 89
Mint 250
Missletoe 311
Mist-flower 158
Mitrewort 129
Monkey Flower 239

PAGE.
Monk's-hood 10
Moon-seed 15
Morning Glory 273
Moss Pink 275
Motherwort 261
Mountain Ash 110
" Fringe 24
" Holly 222
Morning Bride 155
Mudwort 241
Mulberry 335
Mullein 235
Mullein Pink 50
Musk Melon 123
Mustard 32

Narcissus 366
Nasturtion 65
Nectarine 93
Nettle 337
Nettle-tree 312
Nightshade 283 284
Nine-bark 99
Nonesuch 82
Nutmeg Flower 13
Nut-rush 402

Oak 320
Oak of Jerusalem 290
Oat 426
Oilnut 311
Onion 379
Orchard Grass 415
Orpine 126
Osage Orange 336
Osier 329
Ox-eye 179 188

Pæony 12
Painted-cup 245
Painted Ipomopsis 277
Palma Christi 318
Pansey 40
Papaw 13
Pappoose 17
Parsley 139
Parsnip 134, 135, 137
Partridge Berry 152
Passion Flower 121
Paulonia 238
Pea 79, 80
Peach 98
Pear 110, 119
Pearlwort 53
Pellitory 338
Pencil Flower 89
Penny Cress 25
Pennyroyal 252
Pennywort 131,135,137,289
Pepper-bush sweet 215
Pepper-grass 26
Pepper-root 28
Peppermint 250
Periwinkle 290
Persimmon Tree 223
Pheasant's Eye 13
Phlox 274
Pickeral-weed 391

PAGE.
Pigmey-weed 125
Pimpernell 228
Pine 339
Pine-drops 220
Pine-sap 221
Pinks 49
Pink-root 154
Pink Grass 362
Pinweed 41
Pipewort 394
Pipsissiwa 220
Pitcher Plant 19
Plantain 224
Pleurisy-root 292
Plum 96
Poison Hemlock 141
Poison Oak 68
Poke-weed 303
Pond Lily 19
Pond-weed 351
Poor-man's Weather-glass 229
Poplar 332
Poppy 21, 22
Potato 279, 283
Prickly Ash 66
Prim or Privet 295
Primrose 226
Prince's Feather 301
Prince's Pine 220
Puccoon 20
Pumpkin 124
Purslane 56
Putty-root 358

Quaking Grass 417
Queen of the Prairie 100
Queen Margaret 170
Quince 111

Raddish 35
Ragged Robin 50
Rag-weed 177
Raspberry 104
Rattle-box 93
Rattle-snake Plantain 362
Red-bud 94
Red Osier 144
Reed 422
Rhubarb 307
Ribbon-grass 427
River weed 312
Robin's Plantain 187
Rock Rose 40
Rocket 23, 24
Rose 105
Rose Acacia 89
Rose Campion 50
Rosebay 217
Rosemary 265
Rosin-plant 177
Rye 425
Rush-grass 410

Sacred Bean 18
Saffron 159, 370
Sage 254
Sandwort 42

PAGE.
Salsify 205
Sanicle 133
Sarsaparilla 142
Sassafras 308
Saxifrage 127
Savory 265
Scorpion Grass 268
Scratch Grass 305
Sedge 403
Seed box 116
Self-heal 259
Seneca Snake-root 76
Senna 94
Sesame-Grass 430
Shad berry 109
Shepherd's Purse 25
Shinleaf 219
Sickle-pod 30
Sida 60
Side-saddle Flower 20
Silk-weed 290
Skull-cap 259
Skunk Cabbage 346
Snail 92
Snake-head 237
Snake-root 297
Snap-dragon 236
Sneeze-weed 187
Snow-ball 150
" berry 148
" drop 366
" Flake 367
Snowy Campion 47
Soapwort 48
Solomon's Seal 375
Sorrel 63, 306
Sorrel Tree 214
Sow Thistle 205
Spanish Needles 185
Spear Grass 418
Spearmint 250
Speedwell 242, 244
Spicewood 308
Spiderwort 386, 393
Spikenard 142
Spike-grass 421
Spike-rush 397
Spindle-tree 73
Spring Beauty 56
" Cress 31
Spruce 340
Spurge 315
Spurrey 54
Squash 125
Squaw-root 231
Squirrel-corn 23
Star-flower 227
Star-grass 367
Starry Campion 47
Star-of-Bethlehem 378
Starwort 162
St. John's-Wort 44
St. Peter's-Wort 45
St. Andrew's-Cross 45
Steeple-bush 100
Stick-seed 269
Stickwort 51
Stone-crop 126
Strawberry 434

PAGE.
Strawberry Blite 299
Straw Flower 200
Succory 200
Sumach 67
Sun-dew 42
Sundrops 115
Sunflower 180
Susan Black-eyed 235
Sweet Alyssum 27
" Brier 106
" Cicily 140
" Fern 327
" Flag 347
" Gale Family 326
" Gum, S. Family 333
" Pepper bush 215
" -Scented Shrub 111
" Sultan 196
" William 49
Sycamore 334
Syringa 130

Tamarack 342
Tanzy 189
Tape-grass 355
Teasel, T. Family 154, 155
Thin-grass 411
Thistle, Th. Tribe 195, 194
Thorn 108
Thorough-wax 138
Thorough-wort 159, 160
Thread-foot 314
Thrift 225
Thyme 258
Tickseed 182
Tiger-flower 370
Timothy 409, 427
Toad-flax 236, 310
Tobacco 280
Toothwort 28
Treacle Mustard 32
Trefoil 90
Trefoil Shrubby 67
Trillium Family 373
Triple-awned-Grass 414
Trisetum 425
True Lily Tribe 381
True Colchicum Family 386
Trumpet Creeper 232
" Flower 232
Tuberose 381
Tulip-tree 14
" Tribe, Tulip 381, 383
Tupelo, T. Family 309
Turtle-head 238
Turnip 345
Tway-blade 356, 363
Twig Rush 402
Twin-leaf 17
" Flower 148
Twist-stalk 386
Two-winged Acanthus 234

Unicorn 388
" Root 388
" Plant 233

Valerian 276
Vegetable Oyster 206

PAGE.
Venus' Looking-glass 209
Vernal Grass 427
Vervain, V. Family 217
Vetch, V. Tribe 77
Vetchling 78
Vine, V. Family 74
Violets 37, 383
Virgin's Bower 2
Virginia Speedwell 244
Viper's Bugloss 266

Wake Robin 373
Wall Cress 30
Wall Flower 33
Walnut 318
Water Arum 346
" Fox-tail 409
" Hemlock 136
" Hemp 299
" Hore-hound 251
" Leaf, W. Family 271
" Lily 18
" Milfoil 188
" Oats 409
" Parsnip 137
" Pimpernel, W. Tribe 229
" Plantain, W. Family 352, 353
" Rice 409
" Shield 17
" Star-grass 392
" Starwort 314, 392
" Weed 354
" Willow 234
" Wort 46
Wax 138
Wheat 423
White Grass 408
Whortle-berry 212
Wild Oats 426
" Rice 409
" Rye 423
Willow 329
" Herb 113
Wind Flower 2
Windsor Bean 80
Winterberry 222
" Cress 29
" green 219
Wire-grass 416
Wolf's-bane 10
Wood Fern 441
Wood Grass 431
" Reed-grass 411
" Rush 389
" Sorrel, W. Family 63
Wool-grass 399

Xyris 393

Yam, Y. Family 371
Yam Root 371
Yard Grass 415
Yarrow 188
Yellow-eyed Grass 394
" Root 7, 15
" Water-lily 19
Yew, Y. Family 344
Yucca 384

FLORAL DICTIONARY.

A: represented by the Apple leaf.
Acacia: Platonic or Chaste Love.
Acacia (Yellow); Concealed Love.
Achilea Millefolia; War.
African Marygold: Vulgar Minds.
Agrimony: Thankfulness.
Almond Tree; Indiscretion—Heedlessness.
Almond Laurel; Perfidy.
Aloe; Misplaced Devotion.
Althæa Frutex; Persuasion.
Alyssum (Sweet); Worth beyond beauty.
Amaranth: Immortality.
Amaryllis; Haughtiness—Pride.
Ambrosia: Love returned.
American Cowslip: You are my Divinity.
American Elm: Patriotism.
American Linden: Matrimony.
American Starwort: Welcome to a stranger.
Anemone: Your Frown I defy.
Anemone (Field): sickness.
Anemone (Garden): Forsaken
Anemone (Wood): Forsake me not.
Angelica; Inspiration.
Apocynum: Falsehood.
Apple-Blossom: Preference—Fame speaks him great and good.
Arbor Vitæ: While I Live.
Arrow Head: Calm repose.
Arum, or Wake Robin: Ardor.
A Roseleaf; I will not trouble you.
Asclepias; Cure for the Heartache.
Ash; Grandeur.
Ash-leaved Trumpet-Flower; seperation.
Aspen-Tree: Lamentation.
Asphodel; My regrets follow you to the Grave.
Auricula; Painting.
Azalea; Your blush has won me.

B; Beach Leaf.
Bachelor's Button: I with the Morning's Love have oft made sport.
Balloon Vine; You are puffed up.
Balm of Gilead Fir; Healing—a Cure.
Balm (Gentle); Pleasantry.
Balsam; Impatience.
Balsam Fir: Always smiling.
Barberry: sharpness—sourness.
Basil: Hatred.
Bayberry: Instruction.
Bay-Leaf; I change but in dying.
Bay-Wreath; Reward of Merit.
Beech: Prosperity.
Bellflower (Blue): Constancy.
Bellflower (Carpatic); I Love my Mountain Home.
Belvidere; I declare against you.
Bellwort: Gracefulness.
Bee-Ophrys; Error.
Betony; surprise.
Bilberry: Treachery.
Birch; Gracefulness.
Bindweed: Humility.
Bird-Cherry: Hope.
Bird's-Foot Trefoil: Revenge.
Black Poplar; Courage.
Black Thorn; Difficulty.
Bladdernut-Tree: Frivolous Amusements.
Blood-Root; Flattery's smile.
Blue-Bottle Centaury; Delicacy.
Blue-flowered Greek Valerian: Rupture.
Blue Canterbury Bell: Constancy.
Blue-eyed Grass; meekness.
Blue Flag: A message.
Blue Lobelia: Purity of heart.
Bonus Henricus: Goodness.
Borage: Bluntness or Roughness of Manners.
Box: stoicism.
Bramble: Envy.
Branch of Currants: You please all.
Branch of Thorns: severity—Rigor.
Broken Straw: Dissension—Rupture.
Broom: Mirth—Neatness.
Bryony: Prosperity.
Bugloss; Falsehood.
Bud of a White Rose: A heart ignorant of Love.
Burdock: Importunity.
Bundle of Reeds with their Panicles: Music.
Butter-cups; Ingratitude.
Butterfly-Ophrys: Gayety.
Butterfly-Weed; Let me go.

C: Cherry Leaf.
Cabbage; Profit.
Calla (Æthiopica); Feminine Modesty.
Calycanthus; benevolence.
Camellia Japonica: beauty and Elegance.
Camomile: Energy in Adversity.
Campanula; Gratitude.
Candy-Tuft; Indifference.
Canterbury Bell (Blue); Constancy.
Cardamine; Paternal Error.
Catesby's Starwort: Afterthought.
Cardinal's Flower: Distinction.
Catalpa-Tree; beware of the Coquette.
Catchfly: snare.
Cedar of Lebanon: Incorruption.
Cedar-Tree: strength.
Checkered Fritillary; Persecution.
Cherry-Tree: Good Education.
Cherry-Blossom; spiritual beauty.

Chestnut-Tree; Do me Justice.
China-Aster; Variety.
China or Indian Pink; Aversion.
China or Monthly Rose; beauty ever new.
Chinese Chrysanthemum; Cheerfulness under Adversity.
Cinquefoil; Parental Love.
Cistus, or Rock-Rose; Popular favor.
Circæa; fascination.
Clematis; fillial Love.
Clove-Gillyflower; Dignity.
Cobœa; Gossip.
Cock's Comb; singularity.
Coltsfoot; Justice shall be done you.
Columbine; Folly.
Common Cactus, or Indian Fig; I burn.
Common Fumitory; spleen.
Common Reed; Complaisance.
Convolvulus Major. Extinguished Hopes.
Convolvulus Minor: Night.
Corchorus; Impatience of Absence.
Corn: Riches.
Cornelian Cherry-Tree: Durability.
Coreopsis; Love at first sight.
Coriander; Concealed Merit.
Coronilla: success crown your Wishes.
Cowslip: Pensiveness.
Cowslip American; You are my Divinity.
Cowslip American White; Angelic Purity.
Cranberry; Hardiness.
Cranesbill Geranium;
Creeping Cereus: Horror.
Crocus: smiles—Cheerfulness.
Cross of Jerusalem: Devotion.
Crowfoot-Bulbous; showy but not welcome.
Crown Imperial: Majesty and Power.
Cuckoo-Pink: Ardor.
Cyclamen: Diffidence.
Cypress; Mourning.
Cypress and Marygold: Despair.
Cypress-Tree: Death and Eternal sorrow.
Cypress Vine: My affections cling to you.

D: Dandelion Leaf.
Daffodil: Deceitful Hope.
Dahlia: Heartless beauty—Instability.
Daisy; Innocence.
Daisy (Garden); I partake your sentiments.
Daisy (White); I will think of it.
Damask Rose: Freshness of Complexion.
Dandelion: Oracle.
Daphne Odora: sweets to the sweet.
Darnel, or Ray Grass; Vice.
Dew-Plant: A serenade.
Dead Leaves: sadness.
Dittany; Birth.
Dodder: Baseness.
Dog's tooth Violet; Youthful Affection.
Dragon Plant; snare.
Dried Flax; Utility.
Dutchman's Breeches: Domestic Happiness.
Dutchman's Pipe; singularity.

E: Epigea Leaf.
Ebony: Hypocrisy.
Elder; Zealousness.
Elm; Dignity.
Enchanter's Nightshade; fascination—Witchcraft.
Endive; frugality.
Eupatorium: Delay.
Evergreen; Poverty.
Evergreen-Thorn; solace in Adversity.
Everlasting: Never-ceasing Remembrance.
Everlasting Pea; Lasting Pleasure.

F: Fir Leaf.
Fennel; strength.
Fern; sincerity.
Fern (Flowering); Revery.
Fig: Argument.
Fig-Tree; Prolific.
Filbert; Reconciliation.
Fir; Time.
Fir-Tree; Elevation.
Flax; I feel your Kindness.
Flax-leaved Goldy-Locks: Tardiness.
Flora's Bell; You are without Pretension.
Flower of an Hour: Delicate beauty.
Flowering Reed: Confidence in Heaven.
Forget me-not; True Love.
Fox glove: I am not changed—they wrong me.
Frankincense: The Incense of a faithful Heart.
Fraxinella: fire.
French Honeysuckle: Rustic beauty.
French Marygold; Jealousy.
Fringed Gentian; A late but welcome Guest.
Fringe-Tree: beauty in smiles.
Frog-Ophrys: Disgust.
Full-blown Eglantine: simplicity.
Fullers' Teasel; Austerity.

G: Cress.
Garden Chervil: sincerity.
Garden Marygold: Uneasiness.
Garden Ranunculus; You are rich in Attractions.
Garden Sage: Esteem.
Garland of Roses: Reward of Virtue.
Gentiana Fritillaria: Virgin Pride.
Geranium (Sorrowful): Melancholy spirit.
Gilly Flower: Lasting beauty.
Glory-Flower; Glorious beauty.
Goat's Rue: Reason.
Golden Cowslip: Days of Childhood.
Golden Rod; Precaution.
Goosefoot: Goodness.
Grape (Wild): Reckless Mirth.
Grass; Utility.
Grass Pink (Callopogon); smile on me still.
Great Bindweed: Dangerous Insinuation.
Guelder Rose; Winter or Age.

H: Hazel branch.
Harebell; Delicate and lonely as this Flower.
Hawkweed; Quicksigtedness.
Hawthorn: Hope.
Hazel; Reconciliation.
Heath; solitude.
Helenia; Tears.
Heliotrope; Devotion.
Hellebore; Calumny.

Hemlock; You will cause my Death.
Hemlock-Spruce; Honor.
Henbane; Imperfection.
Hepatica; Confidence.
Hibiscus; Delicate beauty.
Hickory; Glory.
Hoarhound: frozen Kindness.
Holly; Am I forgotten?
Hollyhock: fecundity.
Honesty: Honesty.
Honeysuckle; Bond of Love.
Honeysuckle (Chinese); Love unsought.
Hop: Injustice.
Hornbeam; Ornament.
Horse-Chestnut; Luxury.
Hortensia; You are cold.
Houstonia; Content.
Hundred-leaved Rose; Graces.
Hyacinth; Grief.
Hydrangea; boaster.

I; Ivy Leaf.
Iceland Moss; Health.
Ice-Plant: Your Looks freeze me.
Indian Cress; Resignation.
Indian Jasmine; I attach myself to you.
Innocence; Innocence.
Ipomopsis Painted; A gay belle.

J; Jessamine Leaf.
Jacob's Ladder: Come down to me.
Japan Rose; beauty is your only Attraction.
Jessamine, or Jasmine: Amiability.
Jessamine (Virginian); soul of my soul.
Jonquil: Desire.
Judas-Tree; Unbelief.
Juniper; Protection.
Justicia; The Perfection of female Loveliness.

K; King's Pear.
Kennedia: Mental beauty.
King-Cup; I wish I was rich.

L: Locust Leaf.
Laburnum; Pensive beauty.
Lady's Slipper; Win me and wear me.
Larch: Boldness.
Larkspur; Levity.
Laurel: Glory.
Laurustinus; I die if neglected.
Lavender: Distrust.
Lead Plant; tranquility.
Leather-flower; Flexibility.
Lettuce; Coldhearted.
Lichen; solitude.
Lilac; first Emotion of Love.
Lilac (White); Youth.
Lily of the Valley; Return of Happiness.
Lime or Linden-Tree; Conjugal Love.
Live Oak; Liberty.
Lobelia (Red): splendor.
Locust; Vicissitude.
London-Pride; Frivolity.
Loose Strife; a king.
Lotus-Flower: silence.
Love in a Mist; Perplexity.
Love in a Puzzle; Embarrassment.
Love lies a-Bleeding; Hopeless, not Heartless.
Lucerne; Life.
Lungwort Blue; Heavenly Aspiration.
Lupine; Voraciousness.
Lupine Wild; Oh leave me not to die alone.
Lychnis; Religious Enthusiasm.
Lythrum; Protection.

M; Mint Leaf.
Madder; Calumny.
Madwort (Rock); Tranquillity.
Maiden-Hair; Discretion—secrecy.
Maize; Plenty.
Magnolia: Peerless and Proud.
Mallow; Mild or sweet Disposition.
Manchineel-Tree: Falsehood.
Mandrake; Rarity.
Maple; Reserve.
Marjoram: blushes.
Marshmallow: Humanity.
Marvel of Peru; Timidity.
Marygold; Inquietude.
Matrimony Vine; Connubial Ties.
May Rose; Precocity.
Meadow Beauty; beauty in Romance.
Meadow-Rue; A balm for a broken heart.
Meadow-Saffron: My best days are past.
Meadow-Sweet; Uselessness.
Mercury; Goodness.
Mesembryanthemum: Idleness.
Mezereon: Love in a snow-wreath.
Michaelmas Daisy; Farewell.
Mignionette; Your Qualities surpass your Charms.
Milk Vetch: Your presence softens my pain.
Mimosa: Sensitiveness.
Mint; Virtue.
Mistletoe; I surmount all Difficulties.
Mock Orange; Counterfeit.
Moneywort; Transient Friendship.
Monk's Hood; Knight-Errantry.
Moonwort; Forgetfulness.
Moschatel; Weak but winning.
Moss (Tuft of); Maternal Love.
Moss Pink; Fraternal Love.
Moss-Rose; Pleasure without Alloy.
Mossy Saxifrage; Maternal Love.
Motherwort: secret Love.
Mountain-Ash; Prudence.
Mountain-Fringe; You are my supporter.
Mountain Laurel; my country's glory.
Mouse-Ear Chickweed; Ingenious simplicity.
Moving Plant; Agitation.
Mulberry-Tree (White); Wisdom.
Mulberry-Tree (Black); I will not survive you.
Mushroom; suspicion.
Musk-Crowfoot; Weakness.
Musk-Rose; Capricious beauty.
Myosotis, or Mouse-Ear; Forget-me-not.
Myrtle; Love.

N; Nightshade Black-Flower.
Narcissus (False); Delusive Hopes.
Narcissus (Poet's); Egotism.
Nasturtium; Patriotism.
Nettle; Cruelty.
Night-blooming Jessamine; Love's Vigil.

Night-blooming Cereus: Transient beauty
Nightshade (Bitter sweet); truth.
Nosegay; gallantry.

O: Oak leaf.
Oak; hospitality.
Oats; the witching soul of music—hers.
Oleander; beware.
Olive: peace.
Orchis; a belle.
Orchis Pink; seclusion.
Orchis Yellow; your aspirations are high.
Orange Flowers: chastity.
Orange-Tree; generosity.
Osier: frankness.
Ox-Eye; Obstacle.

P: Peach leaf.
Painted Cup; you are proud.
Palm; victory.
Pansey, or Heart's-Ease: think of me.
Parsley: entertainment—feasting.
Passion-Flower; religious faith.
Patience Dock: patience.
Pasque Flower: you are without pretension.
Paulonia: a foreigner.
Pea: an appointed meeting.
Peach-Blosson; I am your captive.
Pennyroyal; flee away.
Peony; bashful shame.
Pepper-Plant; satire.
Periwinkle: sweet remembrance.
Persimon; bury me amid nature's beauties.
Persicaria: restoration.
Peruvian Heliotrope; I trust in thee.
Pheasant's-Eye, or Flos Adonis; sorrowful remembrance.
Phlox; unanimity.
Pimpernel; assignation.
Pine: pity.
Pine-Apple; you are perfect.
Pink; lovely and pure affection.
Plane-Tree (Wild); independence.
Polemonium; a declaration of war.
Polyanthus; confidence.
Pomegranate; foolishness.
Pond Lily White; eloquence—the fairest of the fair.
Pond Lily Yellow (Nuphar); much inferior.
Poppy; consolation of sleep.
Potato: beneficence.
Prairie Rose; beauty without excellence.
Prickly Pear; satire.
Pride of China; discussion.
Primrose; early youth.
Primrose (Evening); inconstancy.
Princes' Pine; my affections are fixed.
Privet; prohibition.
Pulmonaria Blue; heavenly aspiration.
Purple Clover; provident.
Pyramidal Bell-Flower; gratitude.
Pyrus Japonica; fairies fire.

Q: Quince blossom.
Quamoclit; busybody.
Queen's Rocket; you are the Queen of coquettes.

R; Rose leaf.
Ragged Robin; wit.
Ranunculus: you are radiant with charms.
Red Bay: love's memory.
Red Mulberry: wisdom.
Red Shanks: patience.
Rest-Harrow: obstacle.
Rhododendron; danger.
Rocket: rivalry.
Rock Rose: fading and transitory.
Rose; beauty.
Rose (Wild): simplicity.
Rose (Acacia): elegance.
Rosebud: youthful charms.
Roses (A Garland of); reward of virtue.
Rosebay: dignity in misfortune.
Rosebay Willow Herb; celibacy.
Rose Campion; you are without pretension.
Rose (White): I am worthy of you.
Rosemary: remembrance.
Rose scented Geranium; preference.
Rudbeckia: justice.
Rue: grace or purification.
Rush; docility.

S: Sage leaf.
Saffron Flower; excess is dangerous.
Saffron-Crocus; mirth.
Sage: esteem.
Sardony: Irony.
Scabius: unfortunate attachment.
Scarlet Fuchsia: taste.
Scarlet Ipomœa, or Indian Jasmine; I attach myself to you.
Scotch Fir: elevation.
Sensitive Plant; timidity.
Serpentine Cactus: horror.
Service-Tree; prudence.
Shaking Saintfoin: agitation.
Siberian Crab-Tree-Blossom; deeply interesting.
Side-saddle Flower (Purple): eccentricity.
Sidesaddle Flower: will you pledge me?
Silver Fir: elevation.
Skull cap: madness.
Small Bindweed: obstinacy.
Small White Violet; candor and innocence.
Snapdragon; You are dazzling, but dangerous.
Snowball: thoughts of heaven.
Snowdrop: consolation.
Solomon's Seal (Small); mystery.
Solomon's Seal (Large); let my name be engraven on your heart.
Sorrel: wit ill-timed.
Southern-Wood; jest or bantering.
Spanish Jasmine: sensuality.
Speedwell; fidelity.
Spider-Ophrys; skill—adroitness.
Spiderwort; transient happiness.
Spindle-Tree; your image is engraven on my heart.
Spiked Speedwell; resemblance.
Spiræ Hpdericum Frutex: uselessness.
Spring Beauty; can you love.
Squirting Cocumber; critic.
St. John's-wort; superstitious sanctity.

Star of Bethlehem; the light of our Faith—follow me.
Stock, or Gillyflower; lasting beauty.
Stonecrop; perseverance.
Stramonium (Common): disguise.
Strawberry: perfect excellence.
Striped Pink; refusal.
Sumach; splendor.
Sunflower; smile on me still.
Swallowwort: medicine.
Swamp Pink; the blush of modesty.
Sweet-Brier, or Elangtine; poetry.
Sweet Flag; fitness.
Sweet Pea; delicate pleasure.
Sweet Sultan; felicity.
Sweet-scented Tussilage; you shall have justice.
Sweet Violet: modesty.
Sweet-William; craftiness.
Sycamore; woodland beauty.
Syringa; memory.

T; Tanzy leaf.
Tamarisk; crime.
Tansy; resistance.
Teasel; misanthropy.
Ten-Week's-Stock; promptitude.
Thistle; austerity.
Thorn-Apple; deceitful charms.
Thrift; sympathy.
Throatwort; neglected beauty.
Thyme; activity.
Trailing Arbutis; you have won my affections.
Tremella Nostoc; resolve the riddle.
Trillium; solitary musings.
Truffle: surprise.
Tiger-Flower; for once may pride befriend me.
Tree of Life; old Age.
Tuft of Moss; Maternal Love.
Tulip; decleration of love.
Turnip; charity.
Twin-Flower (Mitchella); we are united.

V; Violet leaf.
Valerian (Red); accommodating disposition.
Various-colored Lantana; rigor.
Verbena; sensibility.
Vernal Grass; poor, but happy.
Vervain; enchantment.
Venus's Car; fly with me.
Venus's Flytrap; have I caught you at last.
Venus's Looking-Glass; flattery.
Vine; intoxication.
Violet; modesty.
Violet, pedate; I cannot forget.
Virgin's Bower; artifice.
Virginia Spiderwort; momentary happiness.
Volkamenica Japonica; may you be happy.

W; Willow leaf.
Wall-Flower; fidelity in adversity.
Wall-Speedwell; fidelity.
Water-Lily; eloquence.
Walnut; intellect.
Walking-Leaf; how came you here?
Water Lily (White); eloquence—the fairest of the fair.
Watermelon: bulkiness.
Water Star; beauty combined with piety.
Wax-Plant; susceptibility.
Wax Myrtle; I will enlighten you.
Weeping-Willow; melancholy.
Wheat; riches.
White Lily; purity and modesty.
White Mullein; good nature.
White Oak; independence.
White Pink; talent.
White Poplar; time.
White Poppy; sleep of the heart.
White Rose; silence.
White Rose (Dried); death preferable to loss of innocence.
White Rosebud; the heart that knows not love.
White Violet; candor.
Wild or Dog Rose: simplicity.
Wild Indigo: highly colored.
Willow; forsaken.
Willow Herb; pretension.
Wintergreen; send me an answer.
Winter-Cherry; deception.
Witch-Hazel; a spell.
Woodbine; fraternal love.
Wood-Sorrel; joy.
Worm-wood; Absence.

Y; Yarrow leaf.
Yarrow; war.
Yellow Carnation; disdain.
Yellow-Day-Lily; coquetry.
Yellow Gentian; ingratitude.
Yellow Iris; flame.
Yellow Phlox (Erysimum); false-hearted.
Yellow Rose; infidelity.
Yew; infidelity.

Z; Zizia flower.
Zinnia; Absence.

SENTIMENTS.

Rose.—Ivy.—Myrtle.
To Beauty Friendship, and Love.

Jasmine.—Strawberry.—Tulip.
Your amiability, and the excellence of your character, have compelled me to declare my love.

Primrose.—Honeysuckle.—Marygold.
Be not too early entangled in the chains of Love, or yours will be a life of inquietude.

Forget-me-not.—Cypress.—Pimpernel.
Forget me not, for, alas! we may never meet again.

Scarlet Geranium.—Scarlet Ipomœa.—Laurustinus.
In preference, I attach myself to you, but shall die if neglected.

Balsam.—White Daisy.
Be not impatient, I will think of it.

Myrtle.—Sweetbrier.—Lucern.
Love is the poetry of life.

Blue Violet.—Daisy.—Apple-Blossom.
Your modesty and innocence secure you the preference.

Crown Imperial and Turk's Cap Lilies.—Lily of the Valley.
You have the power to restore me to happiness.

Pansies.—Broom.
My heart would be at ease, if my solitude were blest with your society.

Mignionette.—Heliotrope.—Pink.
Your qualities surpass your charms; I love you with a pure and devoted love.

Purple and Yellow Iris.—Hawthorn.
I send you a message of love on the wings of hope.

PPHOB